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General Articles

Some Aspects of Canine Obstetrics*

No. 1.—THE DIAGNOSIS OF PREGNANCY *and* DYSTOKIA—ITS CAUSATION

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Considering the importance of the subject of obstetrics to those concerned with the treatment of disease in the dog, it is surprising that it has received so little attention from members of our profession. There is practically no standard literature on the subject, and when the matter has come up for discussion at meetings such as this, the relief of dystokia is the main topic, whilst those of the physiology of gestation and normal parturition are permanently shelved.

It is proposed, in this short paper, to refer to two aspects of canine obstetrics, *viz.*:—

1. The diagnosis of pregnancy.
2. Dystokia—its causation.

The material submitted to you has been acquired by observation of cases presented in the Poor Out-Patients' Department of the Royal Veterinary College, and deals essentially with the practical side. It is not suggested that these observations are in any way conclusive; in fact, they only touch the fringe of an inexhaustible subject.

The Diagnosis of Pregnancy.

Before discussing the changes which occur in the uterus of the pregnant bitch, it is proposed to refer briefly to the anatomy of the normal genital tract.

Points to which attention is drawn, are:—

A.—The great length of the uterine cornua; their minuteness on cross-section.

B.—The short uterine body.

C.—The great length of the vagina; the narrowness of its anterior portion, and the dilatability of the posterior part.

D.—The size and position of the cervix.

* Papers presented in opening a discussion upon this subject at the meeting of the Central Division, N.V.M.A., held at the Conway Hall, Red Lion Square, W.C.1, on April 12th, 1934.

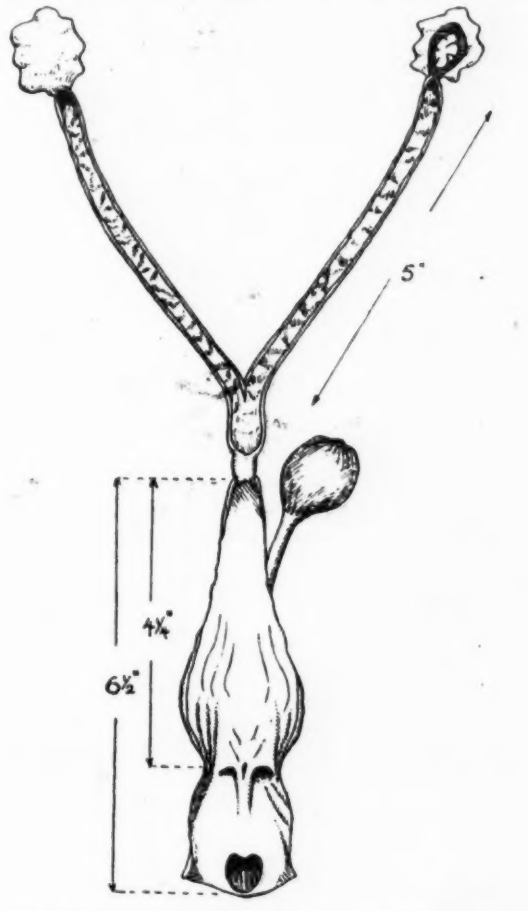


FIG 1. GENITAL ORGANS - 30 lb BULLDOG BITCH. MULTIPAROUS. ½ NATURAL SIZE.

1. ABDOMINAL PALPATION.—By palpation through the abdominal wall the anterior portion of the vagina, the cervix and the uterine body can be detected. They are situated between the colon above and the contracted bladder below. The cervix is situated 1-2 inches in front of the pelvic brim, and slightly below it.

By rectal examination in small subjects (20 lbs. and under) the anterior vagina, the cervix, the uterine body, and sometimes the bifurcation, can be detected under the finger. In large subjects it may be impossible to reach the cervix.

In nervous animals contraction of the abdominal muscles may make accurate palpation impossible. This may be overcome by the administration of a narcotic.

Fertilisation of the ova occurs at the anterior end of the Fallopian tubes; they reach the end of the horn about four days later, and their progression along the uterine horn occupies several

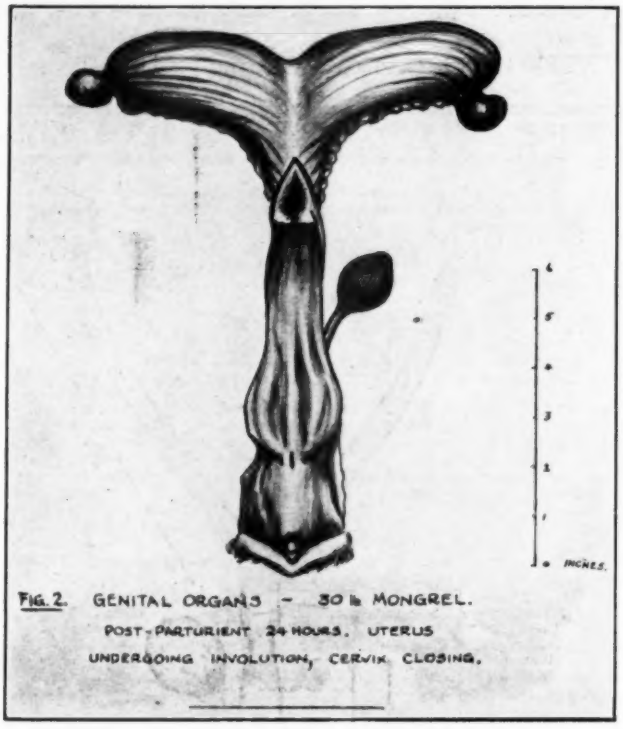


FIG. 2. GENITAL ORGANS ~ 30 lb MONGREL.
POST-PARTURIENT 24 HOURS. UTERUS
UNDERGOING INVOLUTION, CERVIX CLOSING.

more days. At this stage formation of the decidua commences.

18-21 *days.*—The earliest period at which it is claimed a diagnosis of pregnancy can be accurately made by palpation of the uterus through the abdominal wall, is from 18-21 days after mating. At this stage the presence of embryos in the uterus can be definitely detected as a series of tense, oval distensions in the cornua, approximately 12 mm. long and 8 mm. broad. In the small bitch the embryos in the posterior parts of the cornua may be detected by rectal examination. In small bitches, in which the number of fœtuses is low (four or less), it may be possible to state the number present. In the big bitch, however, only the posterior embryos can be felt.

24-30 *days.*—By the 24th day these distensions have become spherical in outline; approximately 15 mm. in diameter. They remain tense and are still easily recognised. Sometimes there is variation in size, the posterior ones being rather smaller than those in front.

The embryonic units maintain this spherical form, but gradually becoming larger until the

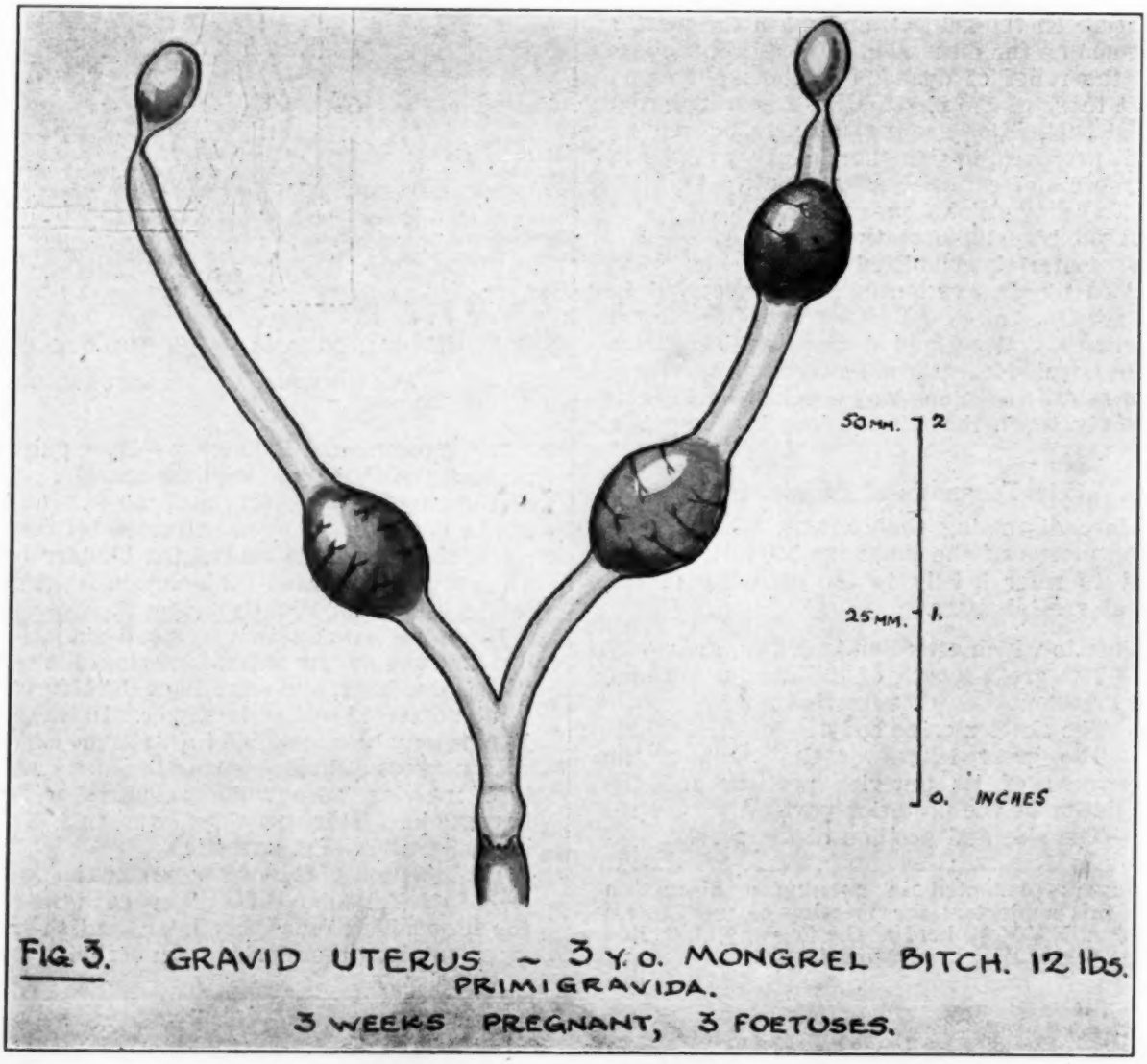


FIG. 3. GRAVID UTERUS ~ 3 Y.O. MONGREL BITCH. 12 lbs.
PRIMIGRAVIDA.
3 WEEKS PREGNANT, 3 FOETUSES.

38th-40th day, by which time they have attained a size of approximately 24 mm. in diameter.

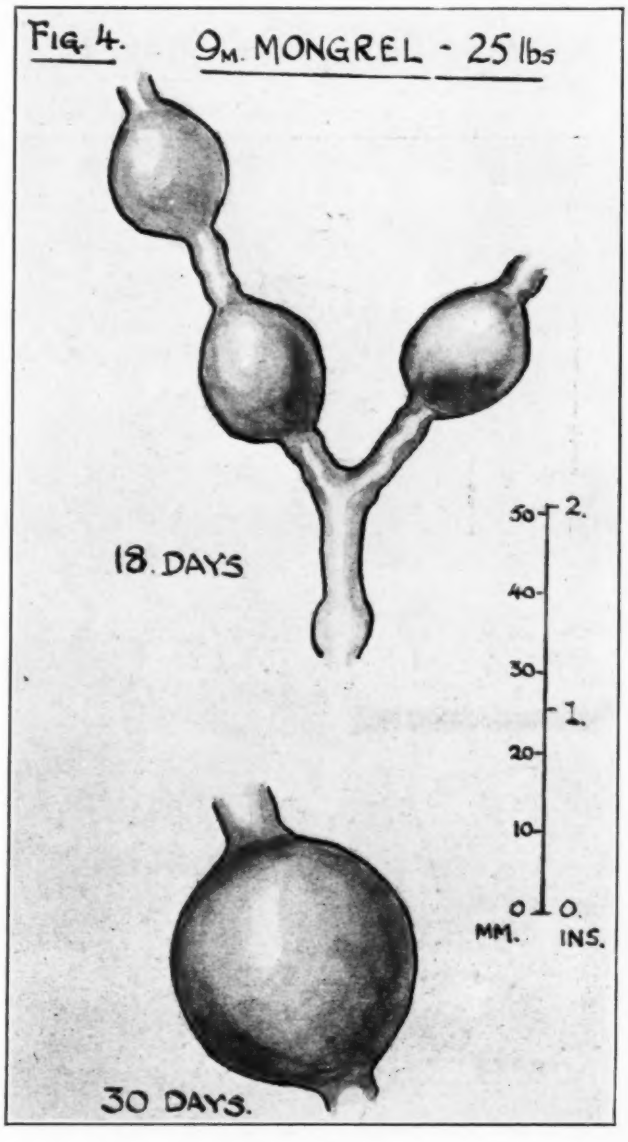
38-42 *days.*—The constricted portions of the cornua, between the fœtuses, commence to dilate; the fœtal units become elongated and distension is much less tense. At this period the uterus comes into contact with the abdominal wall. In the bitch pregnant with multiple fœtuses (three or more), abdominal distension is becoming visible, although the fœtuses themselves are not palpable. In cases of one or two fœtuses only, the accurate diagnosis of pregnancy at this stage may be difficult. Palpation may not reveal any detectable uterine enlargement and there is no obvious abdominal distension.

42-50 *days.*—During this period increase in the size of the fœtuses is very rapid. By the 44th day the posterior ones can be felt between the fingers. (In the 20-lb. bitch—approximately 50 mm. long and 12 mm. broad).

At this point the disposition of the uterus in the abdominal cavity should be reviewed:—

In the animal pregnant with three or more young, each cornu represents an elongated cylinder, 1½-2 inches in diameter, and from 9-12 inches long. Posteriorly they extend into the uterine body, which has by this time become dilated, due to the presence in it of the amniotic sac of the posterior fœtus. Each horn is in two segments—the posterior, which lies on the abdominal floor and passes forward towards the margins of the liver, and the anterior, which lies lateral and somewhat dorsal to it, with its long axis directed backwards towards the pelvis. Each uterine horn thus makes a complete turn.

This disposition is maintained until the termination of pregnancy. During the last stages the uterus almost entirely fills the abdominal cavity.



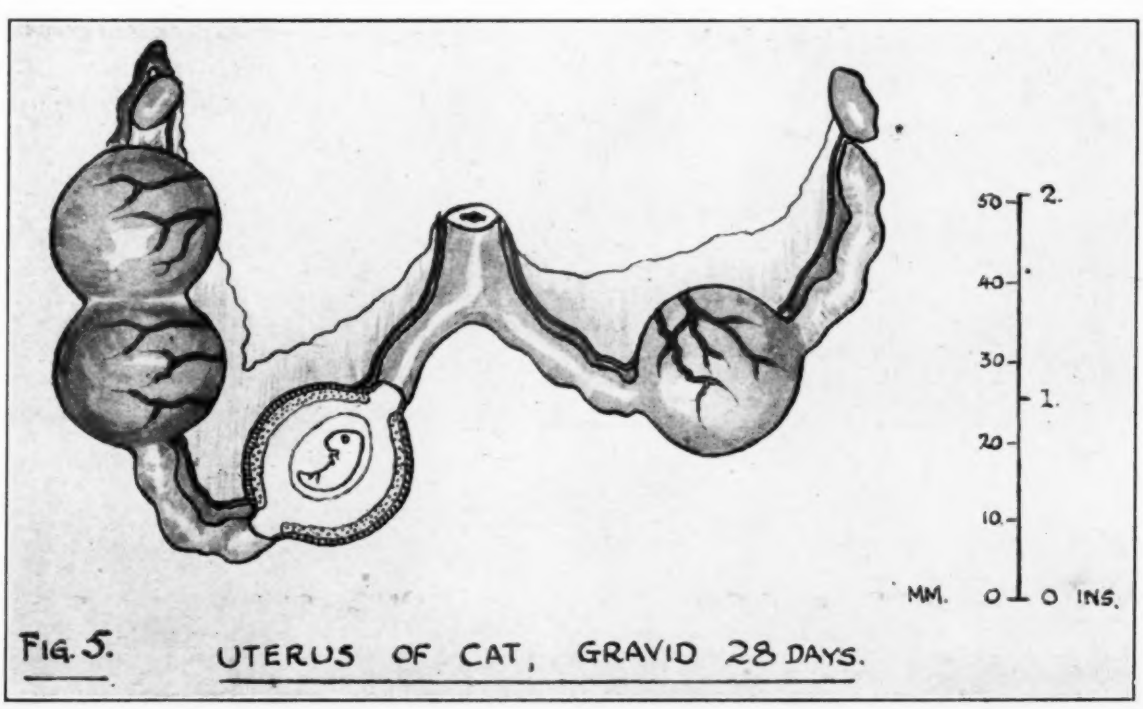


FIG. 5. UTERUS OF CAT, GRAVID 28 DAYS.

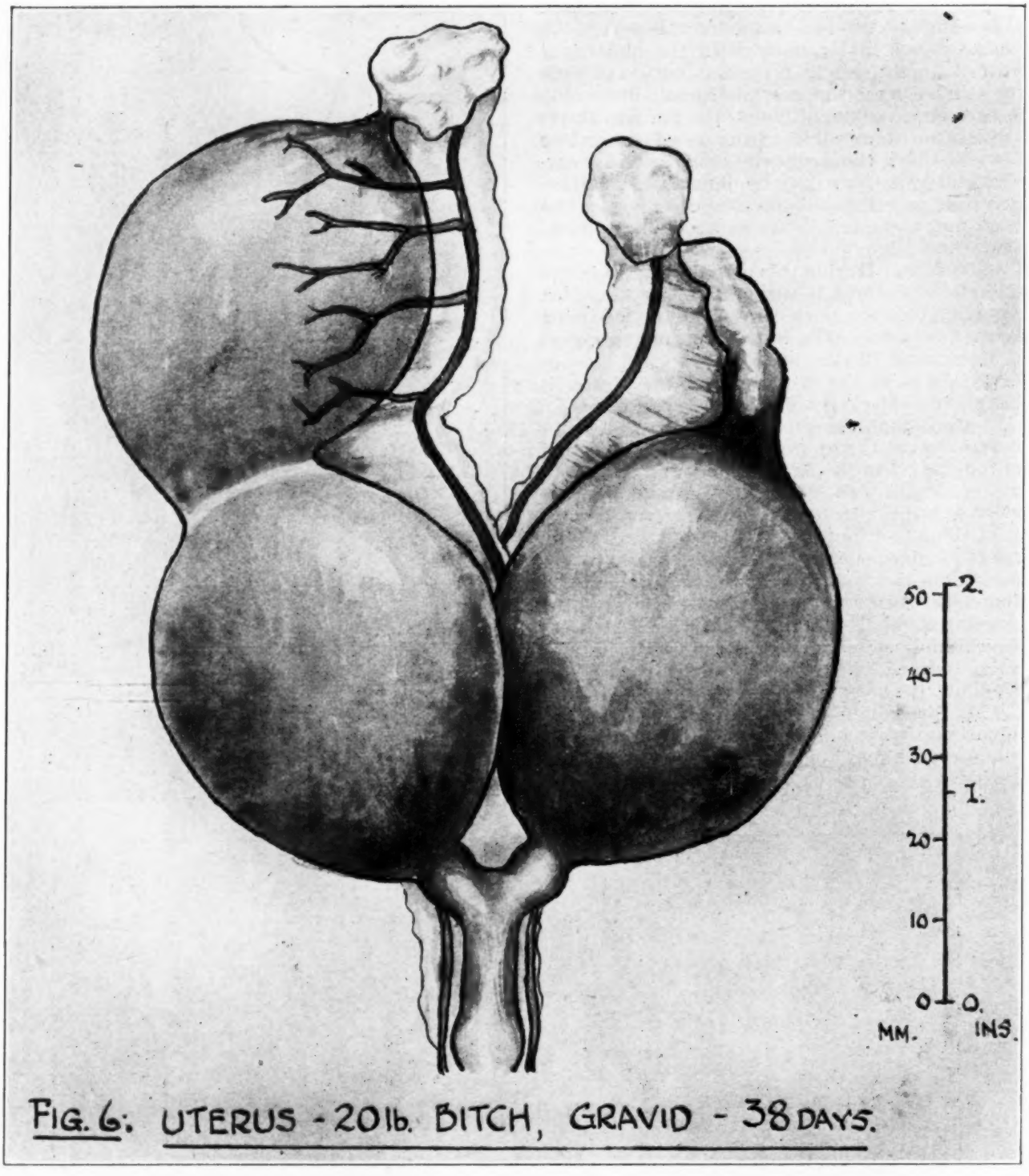


FIG. 6. UTERUS - 20lb. BITCH, GRAVID - 38 DAYS.

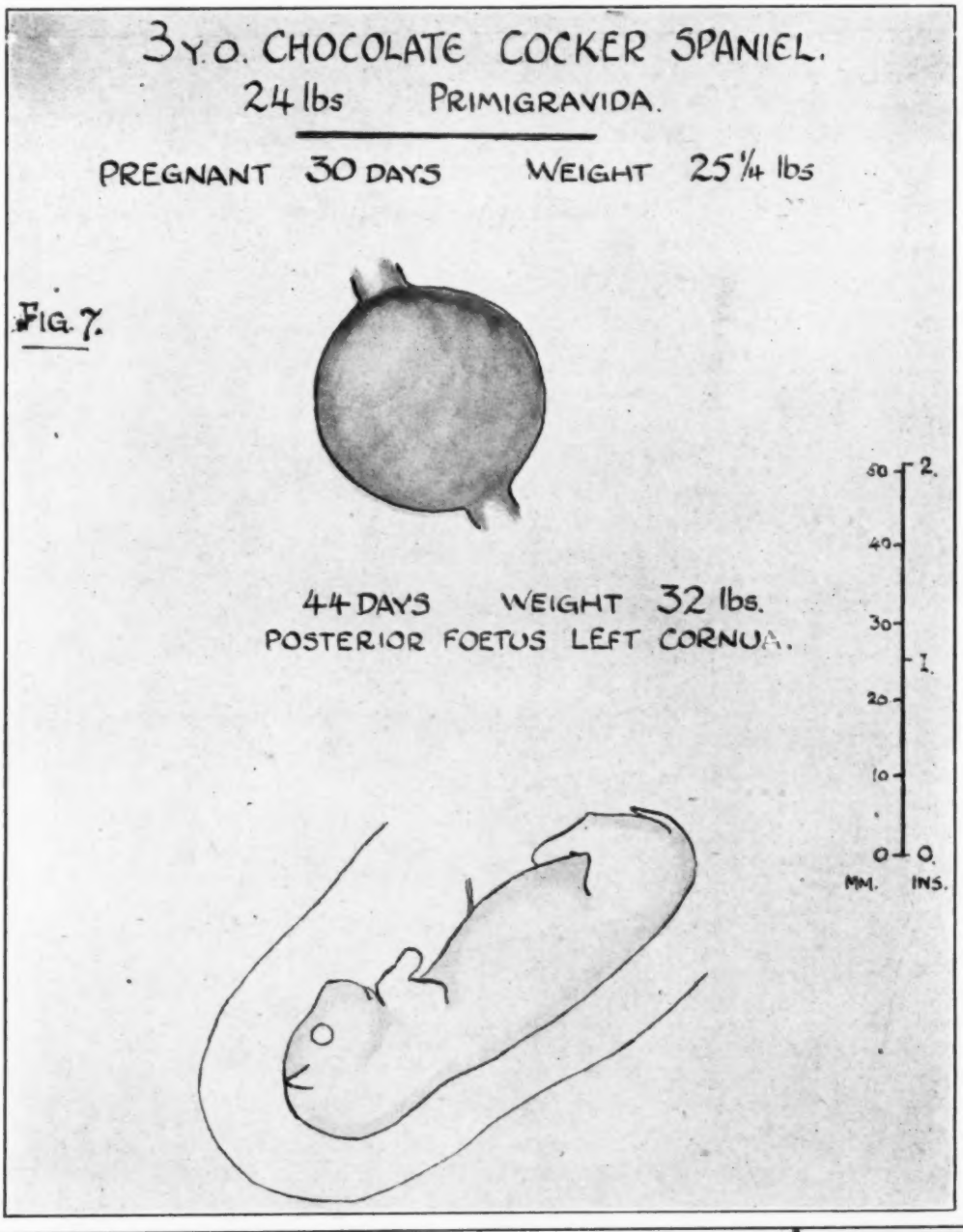

3 Y.O. CHOCOLATE COCKER SPANIEL.
24 lbs PRIMIGRAVIDA.
PREGNANT 30 DAYS WEIGHT 25¼ lbs
44 DAYS WEIGHT 32 lbs.
POSTERIOR FOETUS LEFT CORNUA.
50
40
30
20
10
0
2.
1.
0.
MM.
INS.

FIG. 7.

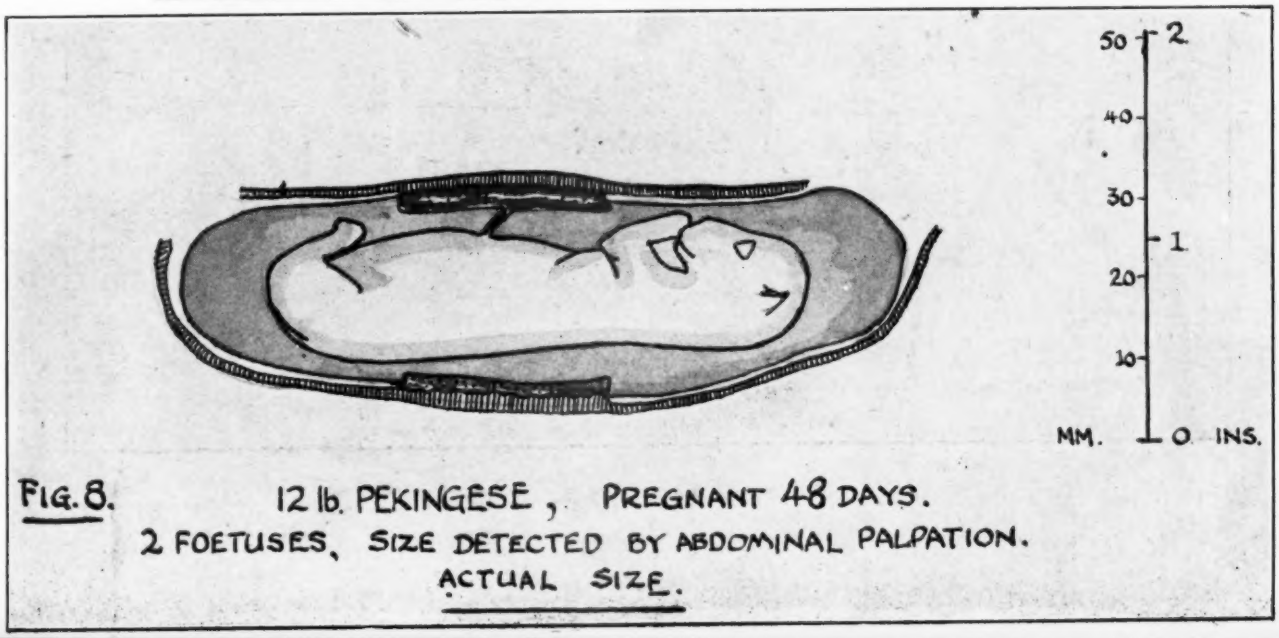

12 lb. PEKINGESE, PREGNANT 48 DAYS.
2 FOETUSES, SIZE DETECTED BY ABDOMINAL PALPATION.
ACTUAL SIZE.
50
40
30
20
10
2.
1.
MM.
0 INS.

FIG. 8.

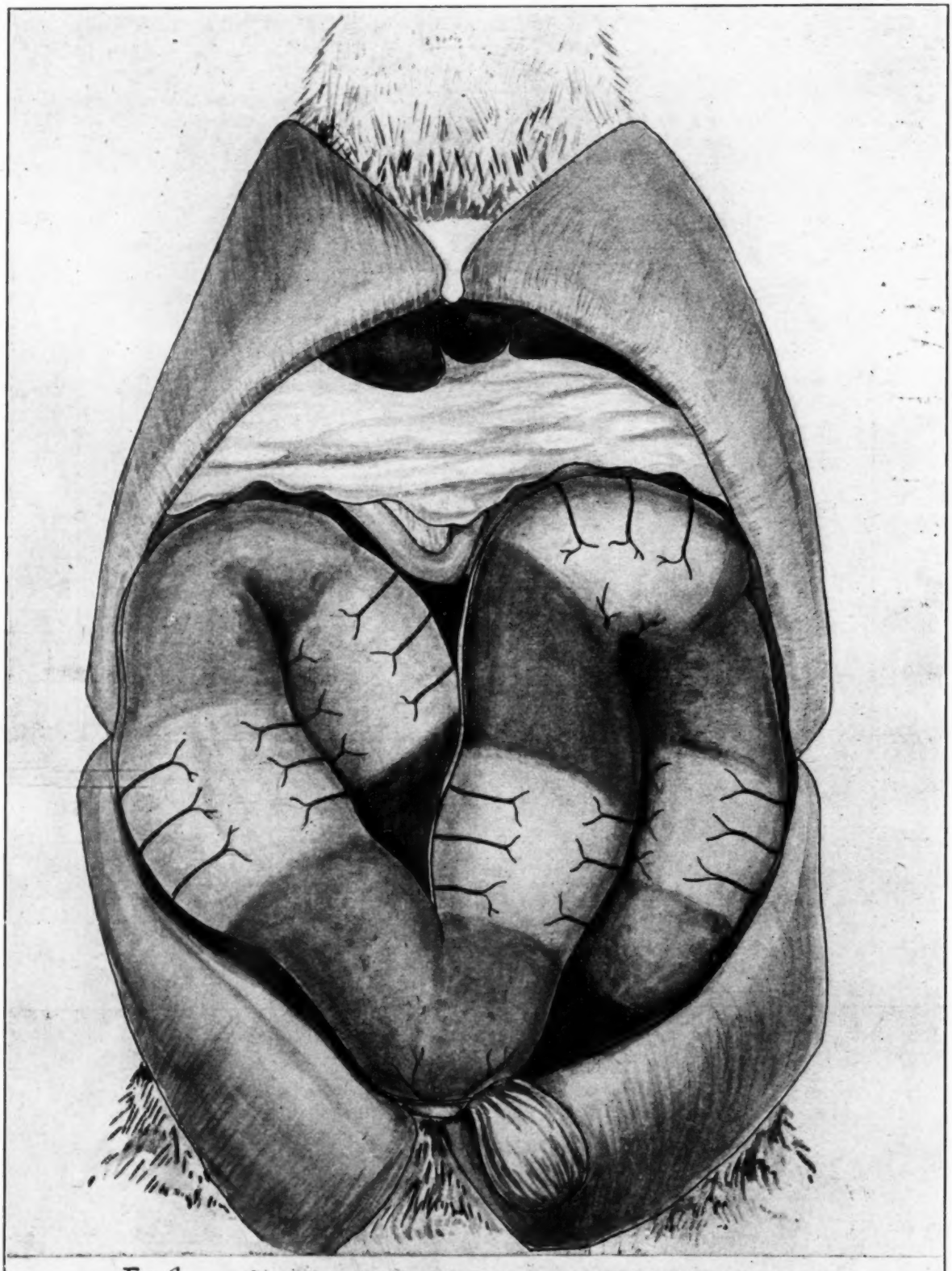


FIG. 9. 9 MONTHS CAT. PRIMIGRAVIDA, PREGNANT 6½ WEEKS.
ABDOMINAL WALL REFLECTED, INDICATING SIZE & DISPOSITION OF UTERUS, GRAVID WITH 5 FOETUSES.

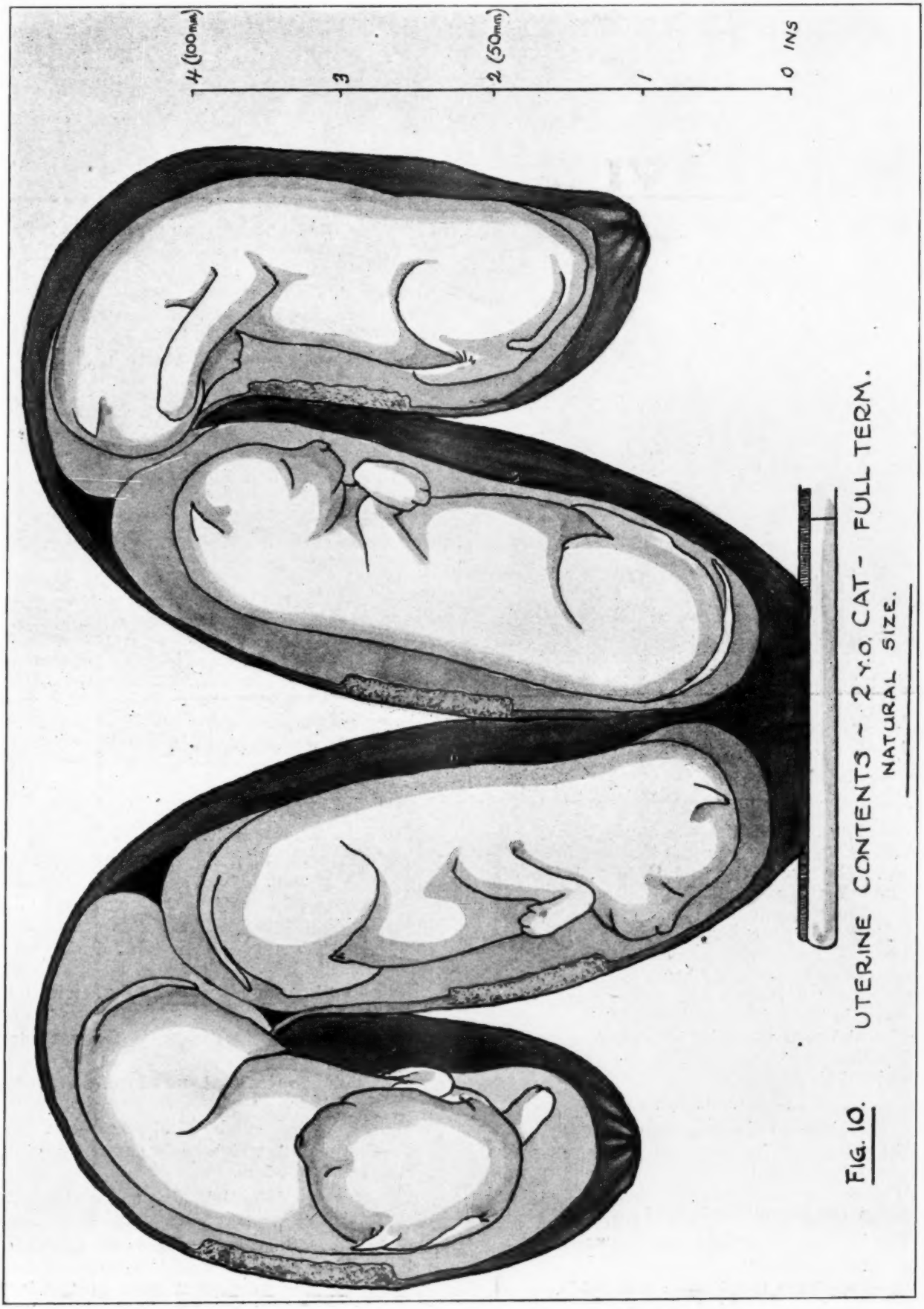


FIG. 10. UTERINE CONTENTS ~ 2 Y.O. CAT ~ FULL TERM.
NATURAL SIZE.

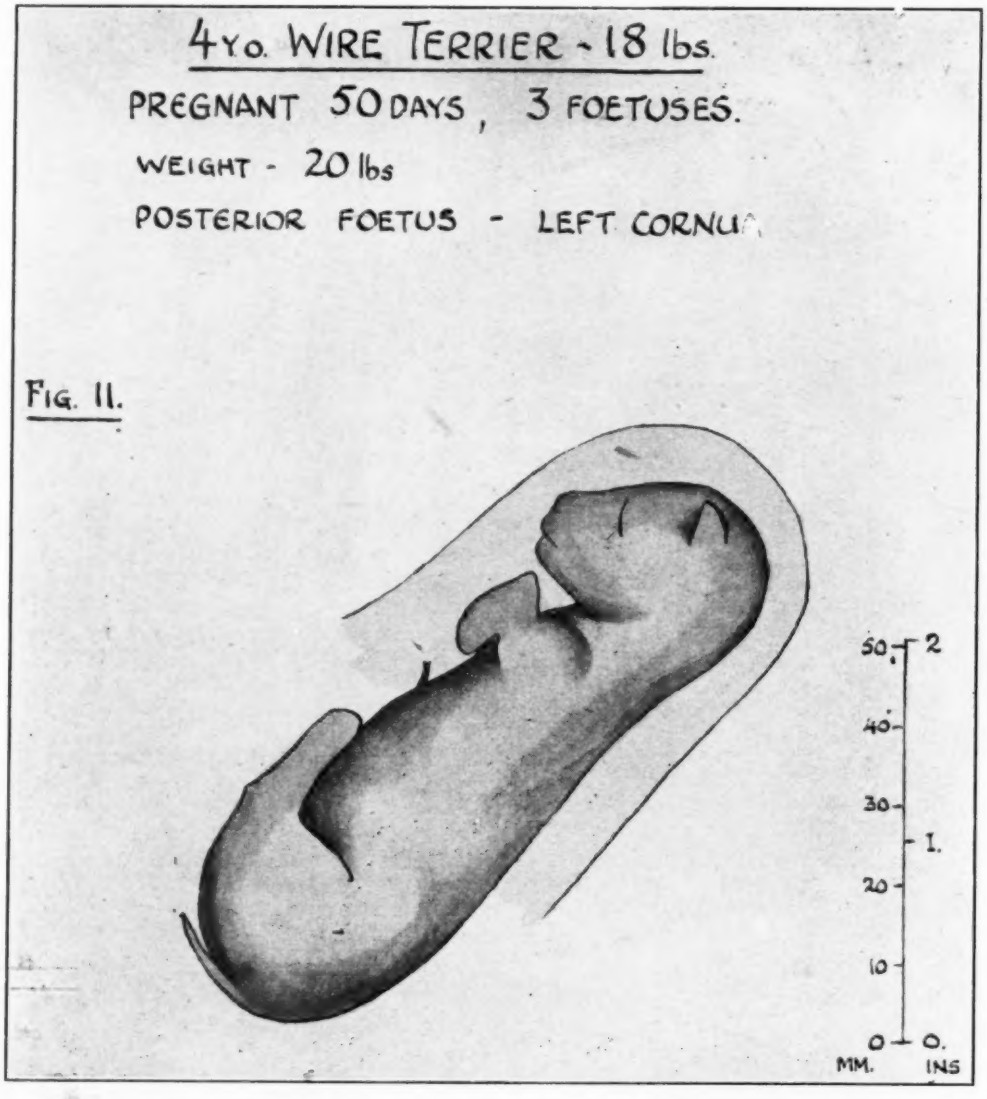


FIG. 11.

50-63 days.—From the 50th day onwards there should be no difficulty in the diagnosis of pregnancy. The size of the fœtuses is such that the outline of the posterior ones can readily be detected by abdominal palpation. In the case of the bitch pregnant with one fœtus, in which abdominal palpation is resented, a rectal examination should remove doubt. The animal's foreparts should be raised and the uterus pressed backwards towards the pelvic inlet by pressure on the abdomen with the left hand, whilst the index finger of the right is used for rectal examination.

2. Increase in Body-Weight.—The contents of the gravid uterus cause no appreciable increase in the weight of the bitch during the first five weeks of pregnancy. From this point body-weight increases. The rise is most marked between the 6th and 8th weeks.

The increase in weight comprises:—

A.—The fœtuses.
B.—The fœtal membranes and fluids.
C.—The hypertrophied uterus.
D.—Deposition of fat.
E.—In the terminal stage, hypertrophy of the mammary glands.

It is proposed to review the case of the 25-lb. mongrel bitch, 9 months old.

A.—Total increase in weight during pregnancy, 12 lbs.

B.—Loss in weight immediately after whelping, 7 lbs.

C.—Total weight of six puppies at birth, 3 lbs. 8½ ozs.

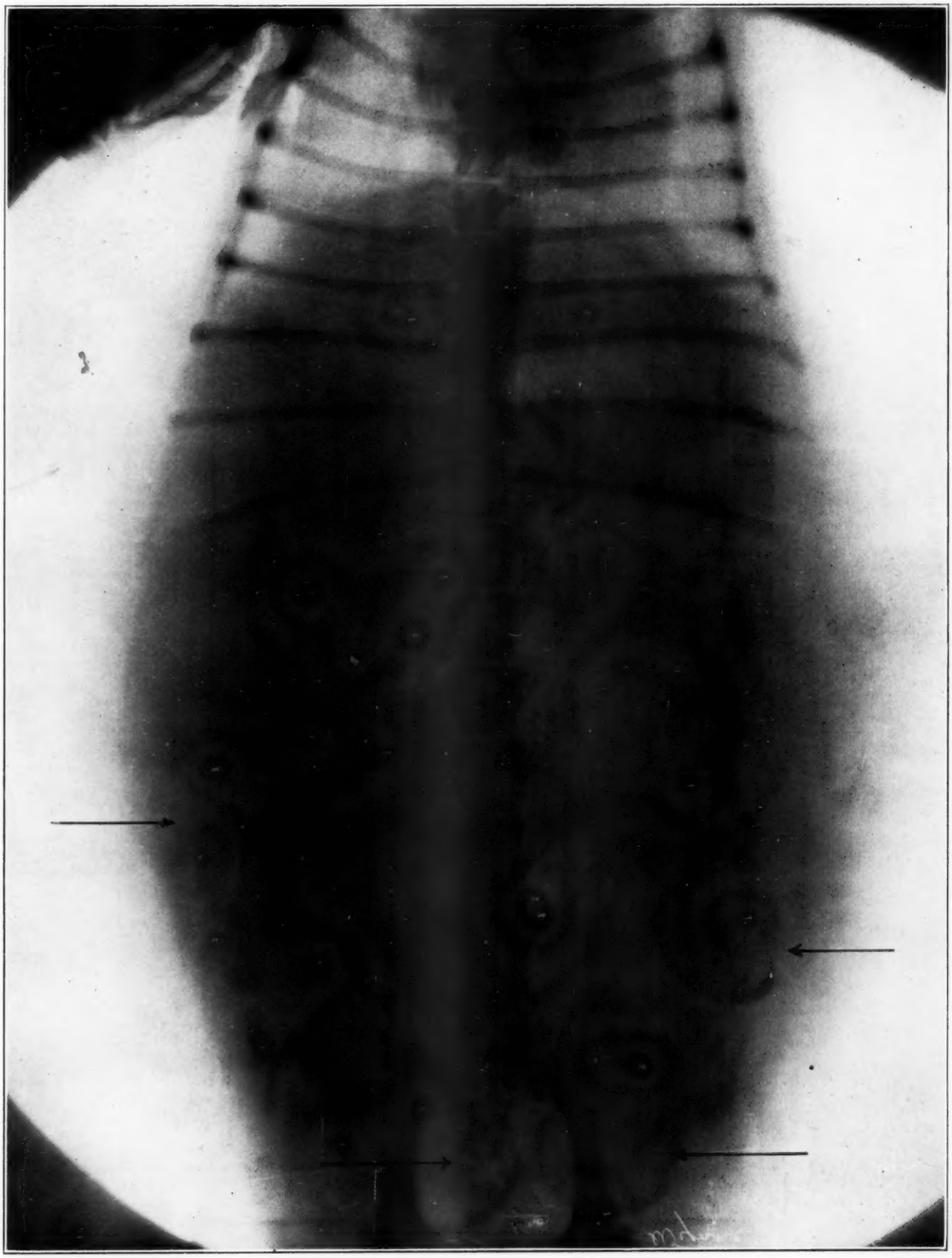
D.—Weight of fœtal membranes (average 2 ozs.), 12 ozs.

E.—Estimated weight of uterus, 8 ozs.

F.—Estimated weight of mammary glands and fœtal fluids, 1 lb.

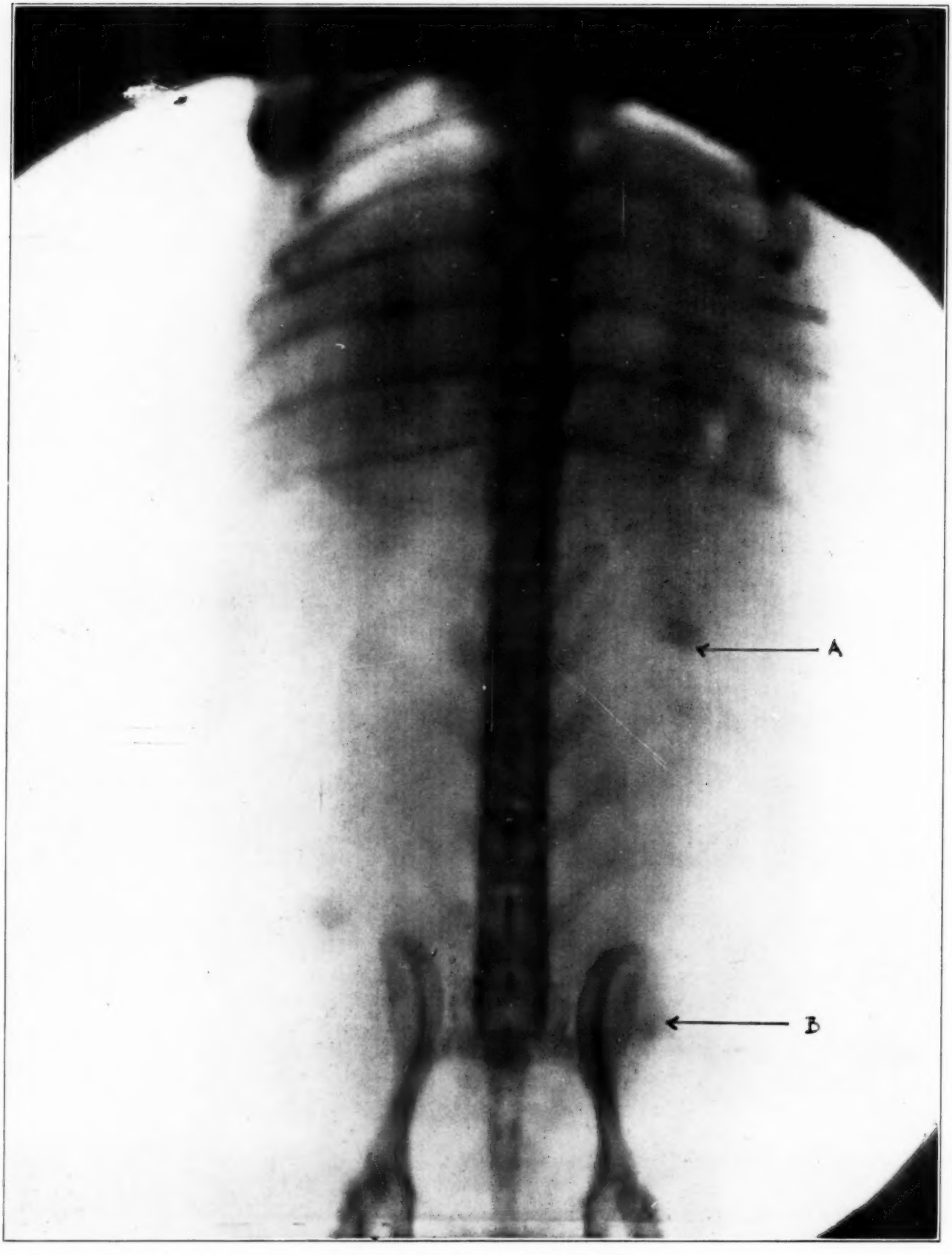
G.—Increase in weight due to the deposition of fat, 4½ lbs.

This deposition of fat is most marked in primigravida, and it would appear to be a storage for the subsequent need during lactation. It is rapidly lost, and in the bitch under



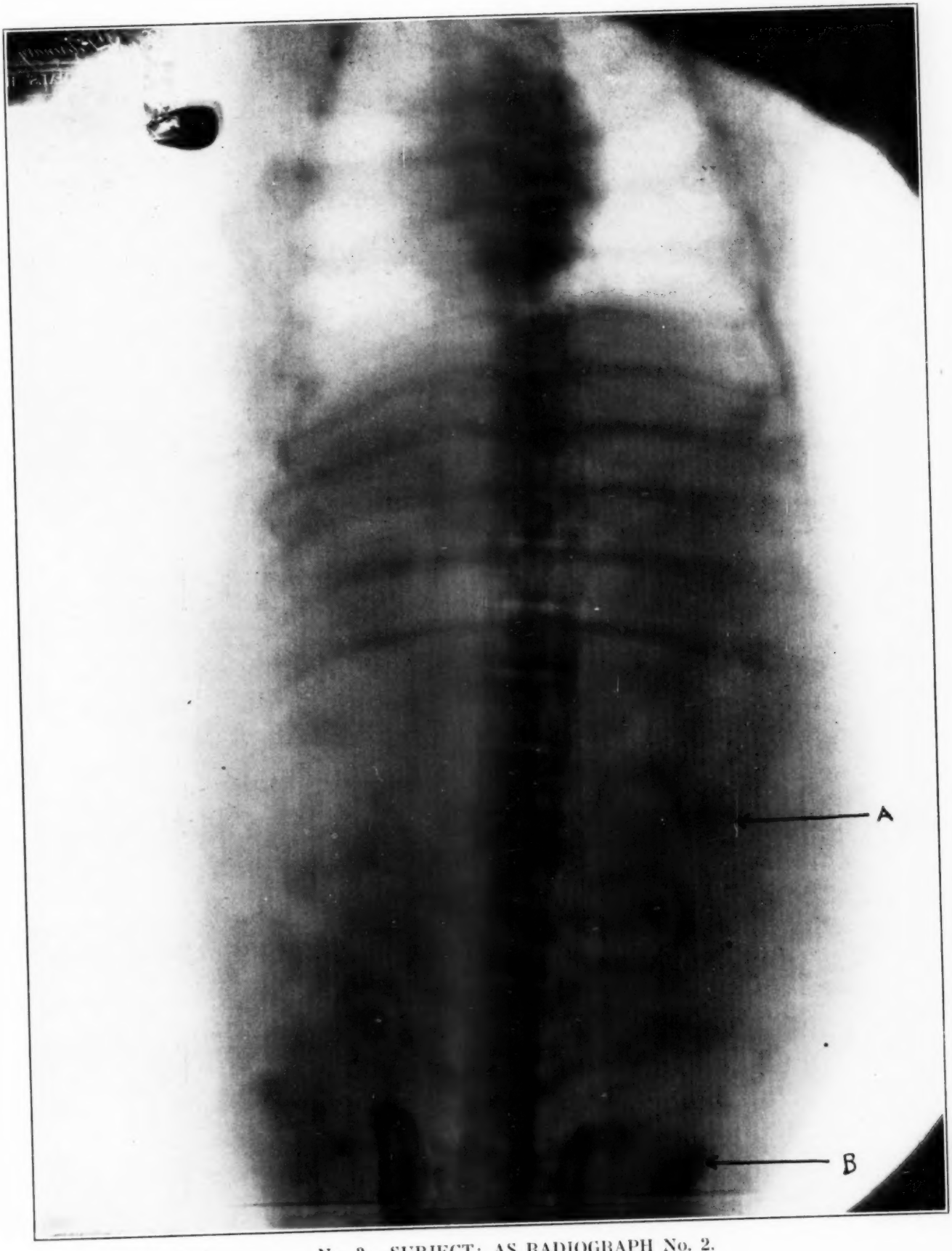
Radiograph by H. J. Ede.]

No. 1.—1½ YEARS WIRE TERRIER.
PREGNANT 60 DAYS, 4 FŒTUSES.
(Fœtal heads indicated by arrows.)



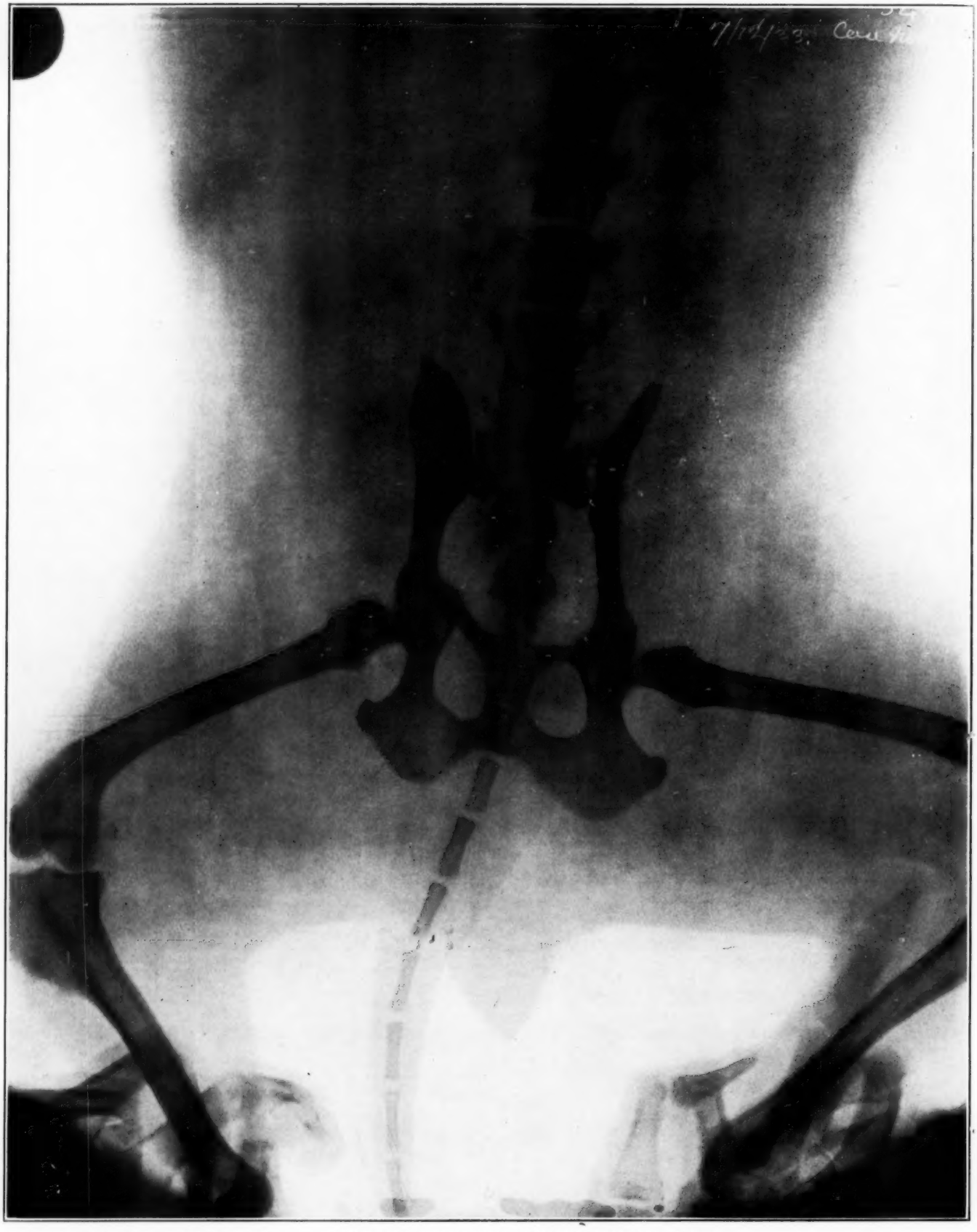
Radiograph by H. J. Ede.

No. 2.—4 YEARS PEKINGESE BITCH.
PREGNANT 49 DAYS, 2 FŒTUSES. ARROWS INDICATE:—
A.—Fœtal Mandibles. B.—Fœtal Pelvis.
Compare with radiograph No. 3.



Radiograph by H. J. Ede.]

No. 3.—SUBJECT: AS RADIOGRAPH No. 2.
56 DAYS.



Radiograph by H. J. Ede.] No. 4.—4½ YEARS MONGREL POMERANIAN. 17 lbs.
PREGNANT 57 DAYS. 4 FŒTUSES.
Crush fracture, left pubis and ischium.

review, although her weight immediately after parturition was 29½ lbs., at the end of 14 days' lactation it was reduced to her original body-weight—25 lbs.

Increase of weight serves as a guide to the number of fœtuses present.

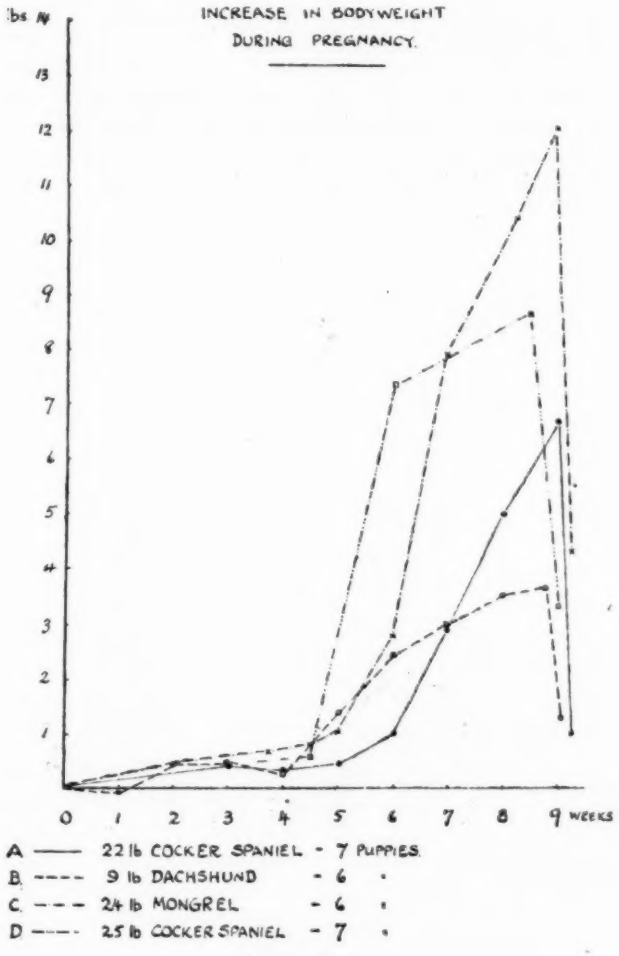


TABLE I.

Weights of Fœtal Units.

Subject.	Normal Weight.	Loss at Parturition.	No. of Young.	Weight of Fœtal Unit.
6 y.o. Toy Dachshund ...	9 lbs.	2½ lbs.	5+1*	7 ozs.
1½ y.o. Terrier ...	11 "	2lb. 10oz.	4	10½ "
4½ y.o. X-bred Pom.	17 "	3½ lbs.	4	14 "
1½ y.o. Spaniel ...	22 "	5½ "	7	12½ "
5 y.o. Sealyham	23 "	4 "	5	13 "
3 y.o. Spaniel ...	24 "	5½ "	7	12½ "
9 m. Mongrel ...	25 "	6½ "	6	16 "

* Incompletely developed.

It will be seen from these figures that provided allowance is made for fat, hypertrophy of the uterus (4-8 ozs.) and hypertrophy of the mammary glands (4-8 ozs.), a fairly accurate estimate of the number of young can be made.

3. Changes in the Mammary Glands.—The changes which occur in the mammæ and teats during pregnancy are best observed in primigravida, for in these they may give an accurate indication as early as the 21st day. Often, however, nothing is detectable until about the 35th day. The first change observed is that the teats become bright pink in colour, slightly enlarged and distinctly turgid (they stick out). (Size: Across base 7-8 mm.; base to tip 10 mm.). This condition persists until about the 45th day, when they become larger, softer and tumefied. (Size: 10-12 mm. in each dimension.) About this time pigmentation of the teat may occur. The whole teat may take on a bluish hue, or a ring of pigment may be present around the tip.

Noticeable hypertrophy of the glands is present from the 50th day onwards, whilst a watery secretion is present about 36 hours before parturition. Milk secretion occurs at the time of whelping.

In multiparous bitches, or those which have acquired enlargement of the teats and mammæ from previous phantom pregnancies, no characteristic indications occur until the terminal stages of gestation, when active hypertrophy commences. Milk is generally present in the glands 3-4 days before parturition.

4. Radiography.—Radiography may be of value as a diagnostic aid in the later stages of pregnancy. Results, however, are extremely variable, and considerable expertness on the part of the radiographer, in this particular subject, is necessary before fœtuses can be demonstrated with certainty, even at full term.

Bone development is most rapid in the last few days of intra-uterine life of the fœtus, and it is improbable that the bony outline will be demonstrable before the 58th day.

It is more difficult to demonstrate a number of small fœtuses than one or two large ones; again, it is easier to demonstrate fœtuses in the cat and small bitch than in the large bitch.

Mr. H. J. Ede, who has been collaborating with me on this subject, has been successful in demonstrating fœtuses as early as the 49th day. [Radiographs submitted for inspection.]

The value of radiography in canine obstetrics lies in the demonstration, at full term or after, of single fœtuses, particularly in big or fat subjects, when palpation fails; and, secondly, the demonstration of presentation in obstructive dystokia.

5. Zondek and Ascheim Reaction.—In 1928 it was discovered by these workers that the urine of pregnant females contains œstrogenic hormone, whereas that of non-pregnant females does not.

By the injection of such urine into immature female mice, corpora lutea atretia are formed in the ovaries. The mice are killed on the fifth day after injection. This method has been used for the diagnosis of pregnancy in women, and, I

believe, in mares. In the human subject it is said to be accurate in 96 per cent. of cases, the reaction occurring as early as four weeks after conception.

If, as is claimed in this paper, pregnancy in the bitch can be accurately diagnosed from the 18th-21st day, by ordinary clinical methods, this test has no great advantage.

6. Differential Diagnosis.—The following is a list of the conditions which have been encountered and might be confused with pregnancy. It is not proposed to discuss them at length.

A.—Neoplasm formation, in the ovaries, uterine cornua, body or cervix. Enlargement of the mesenteric lymphatic glands due to neoplasm or inflammatory conditions. Neoplasm formation in the anterior vagina.

B.—Cystic changes in the ovaries.

C.—Enlargement of the uterine cornua due to cystic degeneration, or pyometritis.

D.—Distension of the abdomen due to ascites, chronic peritonitis with effusion, or pyometra.

E.—Phantom pregnancy.

F.—Gross fatness.

Dystokia—Its Causation

The second aspect of canine obstetrics upon which it is proposed to present a few observations is dystokia—its causation. A large hiatus has been created, for the subject of physiological parturition has been omitted. Unfortunately, time prevents our discussing this very important aspect this evening.

1. Pelvimetry

Obstetricians in human surgery have paid much attention to the subject of pelvimetry. The normal dimensions are recognised, and measurement becomes a routine part of antenatal examination.

In the bitch the subject has received little or no attention, and for this reason it is proposed to demonstrate diagrams illustrating the dimensions of the pelvic inlet in, what are considered, normal subjects. The great variation in size of the respective breeds makes the subject an extensive one, and it will be necessary to dissect a great number before conclusive figures can be given. It is thought, however, that sufficient data have been obtained to give a working idea of the normal pelvis.

It will be seen that the dorso-ventral dimension is, as a general rule, greater than the lateral one. Exception to this was found in two specimens, each being obtained from the short-limbed, big-headed types, the Pekingese and Sealyham.

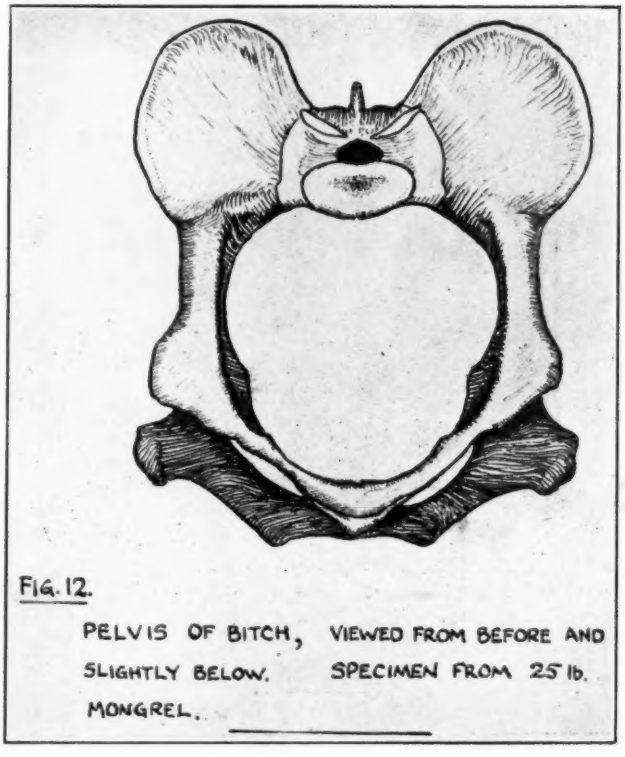


Fig. 12.

PELVIS OF BITCH, VIEWED FROM BEFORE AND SLIGHTLY BELOW. SPECIMEN FROM 25 lb. MONGREL.

TABLE II.

Normal Pelvic Dimensions—Dog. Millimetres.

Weight—lbs.	Breed.	Parous or Not.	Inlet.		Iliac Crests.	Ischial Tubers.
			D/V.	Lat.		
5	Manchester	P	32	30	40	59
11	Pekingese	N	37	39	62	62
12	Mongrel	N	42	35	59	63
12	Pom	N	40	32	48	60
14	Terrier	N	45	38	68	73
17	Terrier	N	43	41	62	72
18	Terrier	P	48	42	62	82
24	Terrier (fat)	N	49	40	65	70
25	Sealyham	P	49	44	70	80
37	Bull-Terrier	N	48	47	85	91
60	Airedale	P	58	50	100	105

Specimens have been obtained from subjects varying in size from 5-50 lbs. The increase in size of the pelvic inlet is not proportionate to the increase in body-weight. The pelvis of the small dog is proportionately much larger than that of the big one.

5	lb.	bitch.	Width	pelvic	inlet	30	mm.
12	,,	,,	,,	,,	,,	35	,,
20	,,	,,	,,	,,	,,	40	,,
35	,,	,,	,,	,,	,,	46	,,
50	,,	,,	,,	,,	,,	50	,,

Insufficient data have been gathered to plot the curve the line of increase would take.

The widest part of the pelvic bones is across the ischial tuberosities, and the variation of this dimension is less than that across the wings of the ileum. An attempt has been made to find the proportion that the width of the pelvic inlet bears to that of the ischial tuberosities. In the cases dealt with it varies from 0·5-0·6.

The measurement across the ischial tubers can be taken with calipers during life.

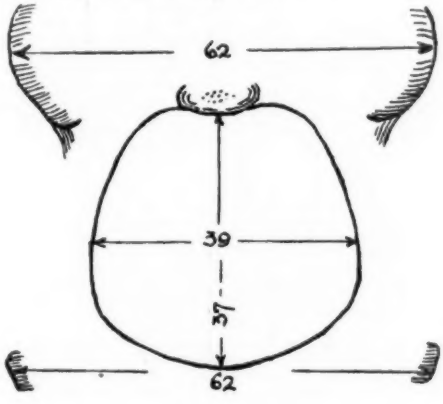
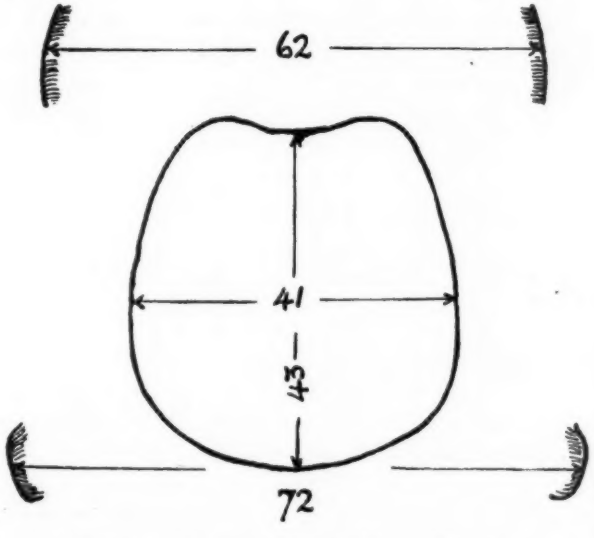
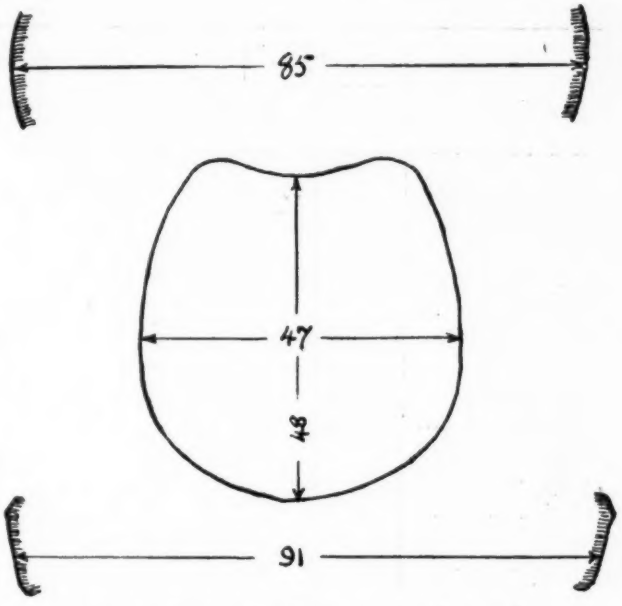


FIG. 13. 11 lb. PEKINGESE (8Y.O)



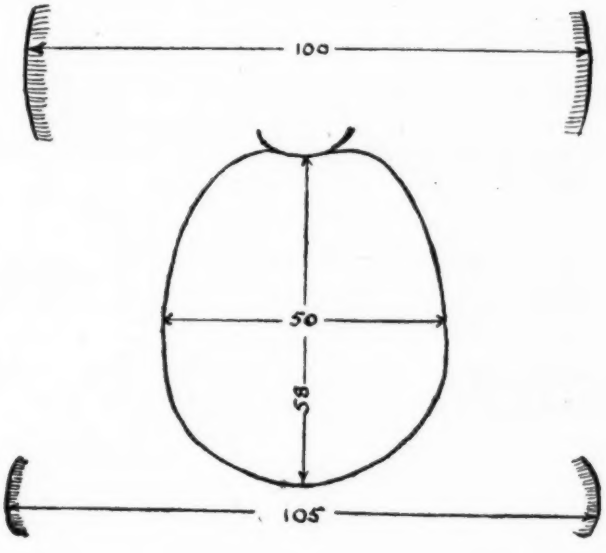
17 lb WIRE TERRIER (2Y.O)

FIG. 14.



37 lb BULL-TERRIER (1Y.O)

FIG. 15.



60 lb AIREDALE (9Y.O)
MULTIPAROUS.

FIG. 16.

2. Fœtal Weights and Dimensions.

It has already been noted that the pelvis of the small bitch is proportionately larger than that of the big one. These figures indicate that the puppy is also heavier in the smaller breeds. A 10-lb. bitch delivers a 6-oz. puppy; whilst that of a 30-lb. bitch is 10 ozs. The width of the head of the 6 oz. puppy is 30 mm., whilst that of the 10 oz. is 34 mm. (These figures are average ones).

TABLE III.

Animal.	Weight—lbs. and ozs.		Period of Gestation. Days.	Weight of Puppies—ozs.										Remarks.
	Before Parturition.	After Parturition.		1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	
6½ y.o. Toy Dachshund (multip.)	12–7	10–2	60	F. 6	M. 5	M. 6	F. 6	M. 6	Fœtal death at 8th week					Normal parturition, duration, 9 hours.
2 y.o. Mongrel (prim.)... ...	14	10			M. 9¾	M. 9¼	M. 7¾							Dystokia, big fœtus and breech. Metrectomy.
4 y.o. Peke (multip.) ...	14–2	12–6	64	M. 5	F. 5½									Normal delivery, duration 4¼ hrs.
1½ y.o. Terrier (prim.)... ...	14	11		M. 5¼	M. 7½	M. 6¾	F. 6¾							Metrectomy at (approx.) 60th day.
1½ y.o. W. Highland T. (prim.)	17	15–8	60	M. 7¾	F. 7									Dystokia, Uterine inertia. Forceps delivery.
8 y.o. Shetland Collie (multip.)	20–14	19		F. 8¾	F. 6¾	Fœtal death at 6th week								Dystokia. "Butt" presentation. In labour, 3 days. Metrectomy.
4½ y.o. Mongrel Pom. (prim.) ...	21	17	59	M. 9	F. 8½	F. 7½	F. 6							Normal parturition. Pelvic inlet narrow, old fracture.
5 y.o. Sealyham (multip.) ...	29	25		M. 9	M. 8½	M. 8	F. 7	F. 6½						Dystokia, stricture cervix. Metrectomy.
1 y.o. Spaniel (prim.)... ...	29	22–7	66	F.* 8	M. 8	M. 9	F. 10	F. 9	F. 8	M. 7				Normal parturition, duration, 4 hours.
3 y.o. Spaniel (prim.)... ...	33–4	28	62	F. 9	F. 11	F. 9½	M. 9	M. 9	F. 6¾	M. 6¾				Normal parturition, duration, 6½ hours.
9 m. Mongrel (prim.)... ...	36–9	29	63	M. 12	F. 10½	F. 8½	F. 9½	F. 10¼	F. 5½					Normal parturition, duration, 4½ hours.
2 y.o. Spaniel (prim.)... ...		27	58	F. 11	M. 10	M. 12	M. 11	M. 10	M. 10	M. 10	F. 11	F. 10		Normal parturition, duration, 8 hours.

*Order of puppies not known.

As a general rule, the greatest width of the fœtus is considerably less than that of the maternal pelvis. The greatest bulk of the puppy lies in its abdominal cavity, fortunately a very compressible structure. The bony parts, the head and the hips, are comparatively small. The limbs are small and flexible, and do not often offer a serious obstruction to delivery, provided that the fœtus is of normal size. In anterior presentation the limbs may be extended

TABLE IV.

Dimensions of Puppies at Birth. Millimetres.

Breed.	Weight—ozs.	Head.		Chest.		Hips.	Remarks.
		Lat.	D/V.	Across Shoulders.	D/V.		
Toy Dachshund	5	30	32	29	35	28	B.
Terrier ...	5¼	29	34	32	38	26	B.
Mongrel ...	5½	28	30	32	28	23	B.
Spaniel ...	6¾	32	32	32	42	30	B.
Terrier ...	6¾	30	32	34	38	24	B.
W. Highland ...	7	36	37	37	34	32	Dystokia.
X-bred Pom. ...	7½	30	30	34	36	28	B.
Mongrel ...	8½	32	32	38	35	28	B.
Spaniel ...	9	38	38	34	44	34	B.
Spaniel ...	9	34	34	34	48	28	B.
Mongrel ...	9¼	31		32		28	Dead.
Mongrel ...	9½	32	32	38	48	32	B.
Mongrel ...	9¾	30	32	34	40	20	Dystokia, breech, 37 m.m. at obstruction.
Mongrel ...	10¼	33	34	42	48	32	B.
Mongrel ...	10½	35	35	46	50	32	B.
Spaniel ...	11	34	36	42	48	32	B.
Mongrel ...	12	32	34	48	46	36	B.

B. = Breathing.

and lying under the chin, thereby increasing the dorso-ventral head measurement, or they may be directed backwards alongside the chest wall so increasing the size of that part. In posterior presentation the hind limbs may be extended backwards and so precede the fœtal hips, or they may be directed forwards (breech) lying along the ventral aspect of the abdomen.

The fœtuses of the small breeds are proportionately bigger than in the large; in addition, they tend to become bigger as the number is reduced, so that the incidence of dystokia is highest in the smaller breeds of bitch, and in these it is most liable to occur when the number of fœtuses is below normal.

It will be readily agreed that the majority of our cases occurs in such breeds as the Pekingese, Yorkshire terrier, Pomeranian, and other small fancy breeds. Dystokia in the greyhound, Alsatian, setter, Airedale or bull terrier, is uncommon.

TABLE V.

Subject.	Across Ischial Tuber's.	Estimated Width Pelvic Inlet.	Width Fœtus.		Remarks.
			Head.	Hips.	
	mm.	mm.	mm.	mm.	
6 y.o. Toy Dachs'd, 9 lbs. (multip.)	70	37	30	29	Easily expelled.
2 y.o. Mongrel, 10 lbs. (prim.) ...	60	33	30	37*	*Breech, dystokia.
1½ y.o. W. Highland, 13½ lbs. (prim.)	80	42	37	32	Dystokia, uterine inertia.
8 y.o. S. Collie, 19 lbs. (multip.) ...	74	38	34	32	Dystokia, "Butt" presentation, 56 m.m. Metrectomy.
9 m. Mongrel, 25 lbs. (prim.) ...	92	46	35	36	Easily expelled.
3 y.o. C. Spaniel, 25 lbs. (prim.) ...	95	48	38	34	Easily expelled.

3. Abnormalities in the Maternal Pelvis

A. *Congenital abnormal pelvis.*—Three cases have been dissected in which, it is considered, there is congenital deformity of the pelvis. It is submitted that by comparison with the tables already given, the following are abnormal:—

Fig. 23.*

(*a*) 24-lb. Sealyham. Nulliparous.

Pelvic dimensions.		*Normal.*
Inlet, lateral, ...	40 mm.	43 mm.
d/v ...	40 mm.	48 mm.
Ischial tubers ...	66 mm.	68 mm.
Tuber coxæ ...	66 mm.	78 mm.

This pelvis is of good shape, but small.

Fig. 24.*

(*b*) 8-lb. Pekingese. Nulliparous.

Inlet lateral ...	32 mm.	
d/v ...	26 mm.	

This pelvis is mis-shapen, and abnormally small.

Fig. 25.*

(*c*) 30 lb. Cross-bred bull-terrier. Multiparous.

		Normal.
Inlet, lateral ...	40 mm.	48 mm.
d/v ...	54 mm.	

Long narrow pelvis. This bitch delivered two litters, 6 and 5, normally.

* Diagrams exhibited

B. *Diseased conditions of the pelvic bones.*—Idiopathic disease of the pelvic bones is not common, and the speaker has not encountered a case of dystokia which could be ascribed to rachitic deformity, or other idiopathic disease of the pelvic bones.

The commonest abnormality is a crush fracture due to an accident. The usual seat of the fracture (the acetabulum is excluded) is the floor of the pelvis, a little to the side of the symphisis; the pubis, from the pelvic brim to the obturatur foramen, and the ischium from the foramen to its posterior margin. Sometimes the shaft of the ileum is involved, whilst occasionally bone callus is found on the under aspect of the sacrum.

The pelvic inlet becomes narrowed laterally, and obstruction is further accentuated by the presence of a variable degree of bone callus. Such a condition in a pregnant bitch is grave, and wherever possible a rectal examination should be performed in the bitch which has, at some time, suffered from lameness of the hind limbs.

In some cases deformity is such that normal parturition is an impossibility. In these, pregnancy must be terminated by surgical interference. This, however, is not the invariable rule, for many such cases will whelp without assistance. The obstetrician must estimate the degree of deformity by pelvic measurements and by rectal examination; the size of the fœtuses

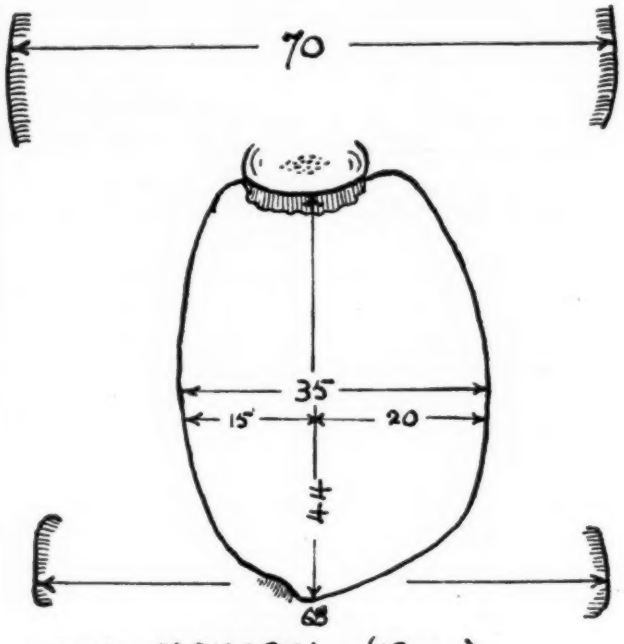


FIG. 17.

by abdominal palpation; and from these findings make his decision. A radiograph of such a pelvis will be helpful.

A case is quoted to illustrate this point.

4½ y. o. Mongr. Pomeranian type. Primigravida. Presented for examination as to pregnancy 29 days after mating. Weight 21 lbs. Palpation—positive, 3 fœtuses detected. Rectal examination revealed a healed crush fracture involving left pubis. Estimated degree of narrowing 5 mm. (From 45 to 40.) Enquiry elicited history of street accident when 6 m. old. Lameness of both hind legs, particularly left. Rapid recovery.

58th day. Bitch again examined, fœtuses palpated, and radiograph of pelvis taken.
[*See radiograph No.* 4.]

Parturition allowed to take its course.

59th day. Bitch whelped four puppies unaided. Weights: 9, 8½, 7½ and 6 oz.

The first puppy is larger than normal.

C. *Diseased conditions of the soft pelvic structures.*—These do not form a common cause of dystokia, although there are several conditions which are occasionally met, which deserve mention.

(1) Neoplasm formation in the vaginal wall. A lipoma or fibroma may arise in the perivaginal tissue, usually in front of the meatus urinarius. It rapidly increases in size, attaining that of a walnut or hen's egg. It is pedunculated and its presence is discovered when it protrudes from the vulva after micturition. Its removal is not a difficult matter, but it should be carried out if possible before parturition commences. Occasionally such a tumour may arise

in the anterior portion of the vagina and pass forward over the pelvic brim into the abdominal cavity. Such an abnormality would form a serious case of dystokia. The speaker has encountered such a condition in the non-pregnant bitch, but not at parturition.

(2) Stenosis of the cervix.—This condition is rare. One case has been encountered in a primiparous bitch. Its existence necessitated the performance of Cæsarian section. The cause was undiscovered.

Carcinoma of the cervix is not rare; two cases have been encountered during the past six months. It is most common in old maiden bitches. It must be regarded as a potential cause of dystokia.

4. Disproportionate Size of the Fœtus

Big fœtus.—This is the commonest cause of dystokia. The condition is most likely to occur when the number of fœtuses is below normal (one or two), and is more common in the small breeds. It is often suggested that disproportion in the sizes of the sire and dam is a common cause. I know of no evidence to support this. It must be admitted that it is more frequent in the small individuals of a particular breed. It is more common in primigravida than in multipara.

(The number of ova shed during an œstral period is an interesting subject which has recently received the attention of research workers. J. Hammond, A. S. Parkes and others have shown that it may be influenced by genetic and endocrine factors. The rôle of anterior pituitary hormone in this respect is important. It is suggested that in immature females the available supply of this hormone is in part used up on other matters such as the development of bone.)

There may be considerable variation in the size of individual fœtuses of a single litter. (This is met in cases in which only one mating has occurred, and so does not call for speculation on such questions as superfecundation and superfœtation.)

The posterior fœtuses, the first born, are usually largest, whilst the smallest are last, that is, they have occupied the anterior ends of the cornua.

Dystokia, due to big fœtus, may be partial or complete. In partial dystokia, some portion of the fœtus already protrudes from the vulva. In anterior presentation the head may be born, and the shoulders and chest cause obstruction; whilst in posterior presentation the hind limbs and hips may protrude.

Partial dystokia is more liable to occur in posterior presentation. The fœtal chest becomes distended by the pressure of the abdominal organs through the diaphragm.

In cases of this nature the fœtus almost entirely occupies the vagina, and delivery is dependent upon the pressure exerted upon it by the auxiliary muscles—the abdominal muscles and the diaphragm, rather than uterine contractions themselves.

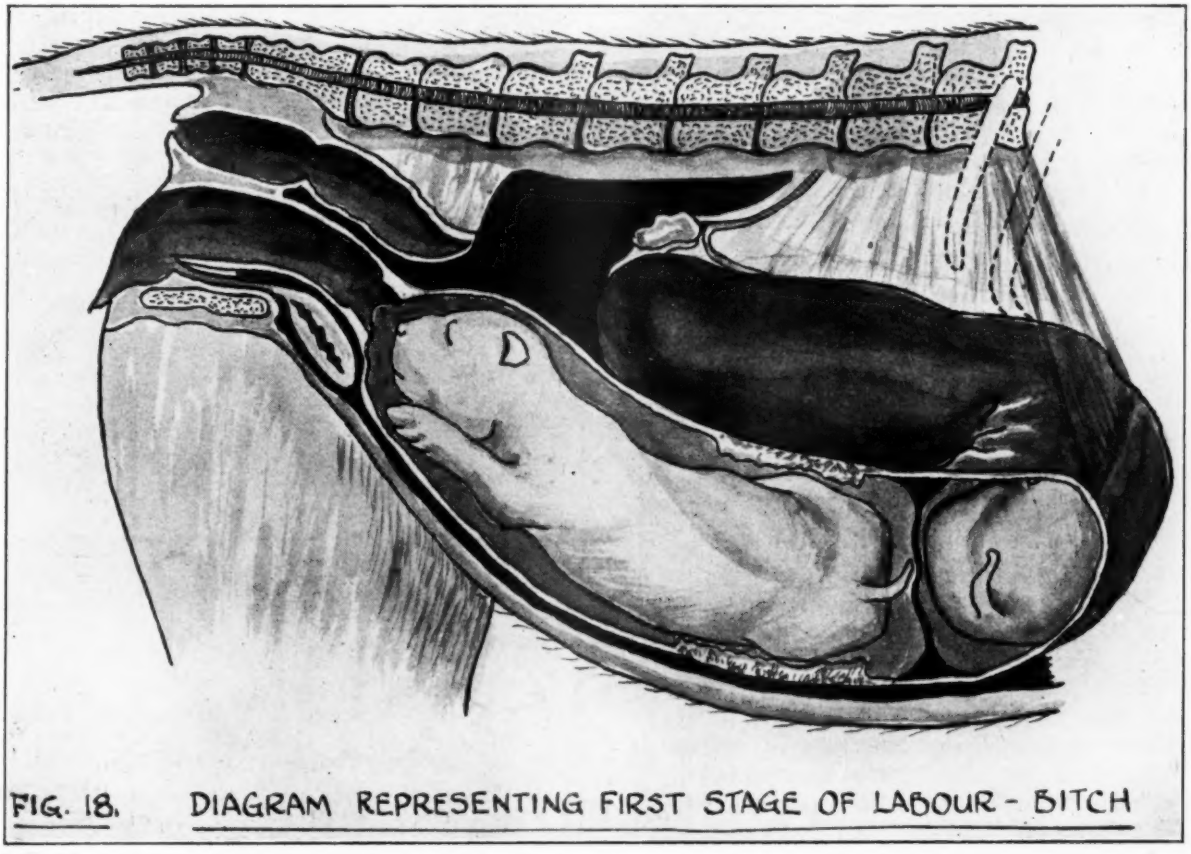


FIG. 18. DIAGRAM REPRESENTING FIRST STAGE OF LABOUR - BITCH

The term complete dystokia is applied to those cases in which the whole of the presented fœtus is retained in the abdominal cavity. The size of the part presented is such that it causes mechanical obstruction to delivery. At the outset the expulsive efforts of the mother are normal and forceful, but unless mechanical assistance is soon forthcoming inertia of exhaustion may set in.

The normal passage of the fœtus through the maternal pelvis is a rapid procedure. Generally one forceful expulsive effort and the whole of the puppy is born. In some cases, especially in primigravida—first fœtus—it may necessitate a series of these efforts and birth is slower. The process is never, however, a matter of hours.

If, on vaginal examination, some portion of the fœtus is found engaged in the pelvic inlet, then delivery, if it is to be normal, will occur quickly. If an hour or more elapses and the puppy is still unborn, then the case is one of dystokia, and the sooner assistance is given the more likely it is that the remainder of parturition will proceed normally.

The subjects of big fœtus and malpresentation are closely linked. It is my opinion that the full-term fœtus may so tightly occupy the uterine horn that it has insufficient room to correct itself for presentation.

During presentation it is necessary for the fœtus to rotate on its long axis. In anterior presentation the cervical and occipito-atlantal joints become extended, the nose and mouth being directed towards the pelvic inlet.

The commonest malpresentation associated with the head is that the cervical and occipito-atlantal joints remain flexed, the fœtal chin is directed towards the sternum, the cranium being presented — "butt" presentation. By this abnormality the width of the part presented may be increased as much as 20 mm.

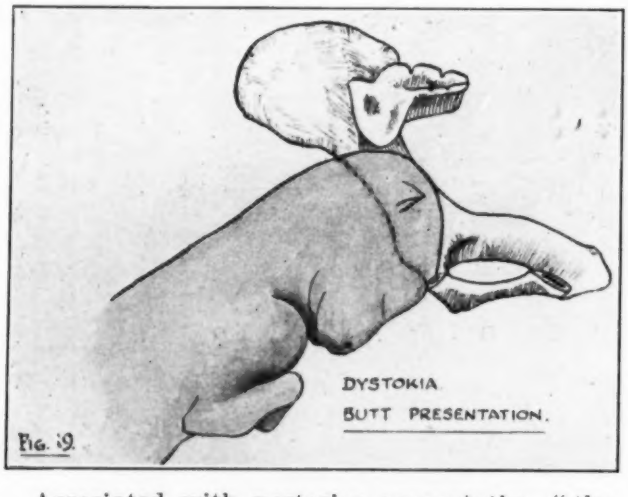


Fig. 19. DYSTOKIA BUTT PRESENTATION.

Associated with posterior presentation "the breech" is liable to cause obstructive dystokia when the fœtus is large. The fœtal hips are narrower than the cranium, and posterior presentation offers no difficulty provided the puppy is of normal size. In the case of big fœtus in which the hind limbs are directed forward, the additional size to the abdomen causes obstruction.

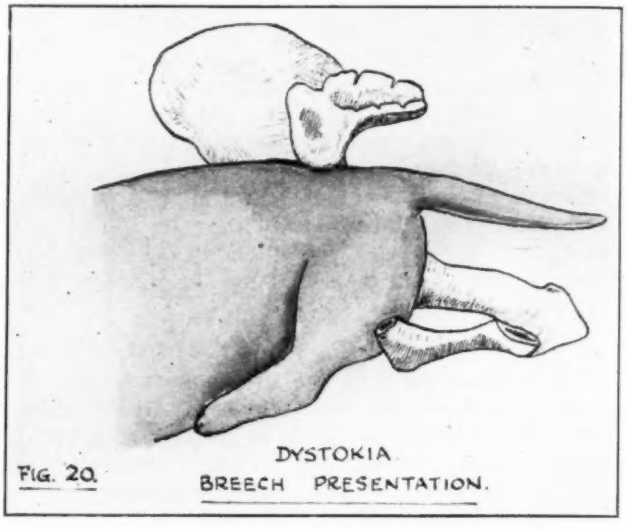


Fig. 20. DYSTOKIA BREECH PRESENTATION.

The third abnormality in presentation to which attention is drawn, is lateral deviation of the head to one side—"head-back." This is most frequently encountered in the last fœtus, and it is suggested that it is due to an insufficiency of room at the anterior end of the horn for the fœtus to develop with its vertebral column extended.

(Not infrequently this insufficiency of room causes premature death of the fœtus from the 6th-8th week.) It will be seen, from diagram 11, that this abnormality is present before parturition occurs. It causes a serious obstructive dystokia in cases of anterior presentation. In posterior presentation the abnormality corrects itself during delivery.

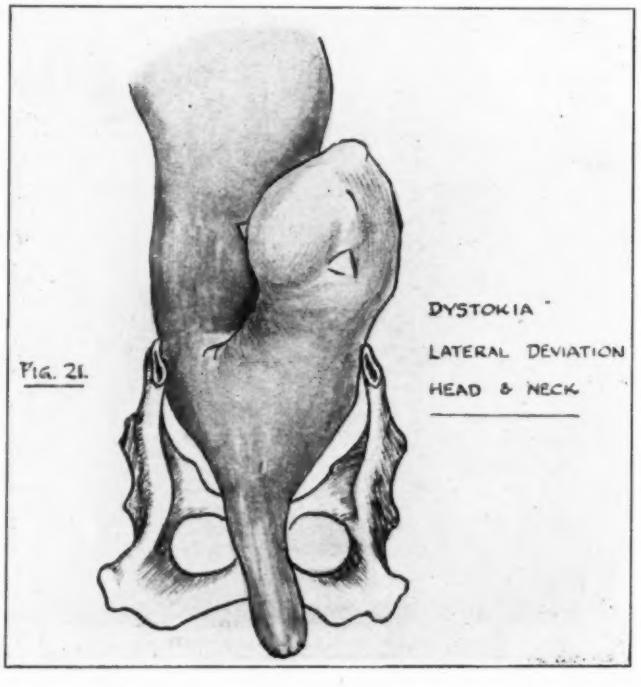


Fig. 21. DYSTOKIA LATERAL DEVIATION HEAD & NECK

5. Uterine Inertia

Uterine contractions at full term are stimulated by endocrine influences from the posterior pituitary body and the ovaries. According to A. S. Parkes, it is probable that the synergistic action of œstrin and oxytoxin play a highly important part in initiating the onset of parturition. The part played by the auxiliary muscles, the abdominal muscles and the diaphragm, would appear to be in part voluntary and in part reflex, contraction being stimulated by the presence of the fœtus at the pelvic inlet.

By uterine inertia is implied either an entire absence of, or a weakening in, the force of uterine contractions. It is customary to classify inertia as primary; and secondary (acquired).

The speaker recognises two types of inertia in the bitch. The first is met in cases of big fœtus and is especially liable to occur in bitches pregnant with one or two fœtuses only.

It would appear that the fœtus so tightly occupies the uterine horn that the force of each contraction upon it is insufficient to cause its movement backwards. In a typical case parturition commences, the bag of waters appears at the vulva, but no further progress is made. Vaginal examination reveals a living fœtus, far forward in the uterine body. Presentation appears to be normal and the customary decision is to give the matter time. Several hours elapse and no progress is made. Uterine inertia becomes complete and unless assistance is forthcoming, separation of the placenta occurs followed by death of the fœtus.

In the early stages the inertia is confined to the segment of the uterus involved, and if relieved the remainder of the organ will probably function normally. If, however, assistance is not forthcoming in a reasonable time, 4-6 hours, the whole uterus becomes inert.

The following case is cited as an example:—

Subject:—18 months West Highland bitch. Normal weight 13½ lbs. Primigravida, 2 fœtuses. Ischial measurement 82 mm. Estimated width of pelvic inlet 40 mm.

59th day, 8 a.m.—Water bag of first fœtus at vulva.
10 a.m.—Vaginal examination reveals living fœtus, well forward in the uterine body, nose and mouth presentation, fœtus lying on right side, rotation not yet complete.
12 noon.—No change. ½ c.c. ext. pituitarii liq. intramuscularly.
2 p.m.—No change in disposition of fœtus.
2.30 p.m.—Dead fœtus delivered by forceps, placenta with fœtus.

Fœtal dimensions:—Weight—7¾ ozs.
Skull, lateral—37 mm.
Shoulders, lateral—40 mm.
Chest d/v plus fore limbs—44 mm.
Hips—32 mm.

4 p.m.—No further progress. ½ cc. ext. pituitarii liq. i/m.
4.45 p.m.—Second fœtus born, posterior presentation, partial dystokia. Hind limbs and abdomen protruding from vulva, obstruction at occiput. Dead fœtus delivered by traction; membranes with fœtus.

Fœtal dimensions.—Weight—7 ozs.
Hips—32 mm.
Chest, lateral—37 mm.
d/v—34 mm.
Skull, lateral—36 mm.

In some cases the force of the uterine contractions may be so restricted that they are insufficient to dilate the cervix. In this case a remarkable train of events follows:—The placenta separates and the fœtus dies. The liquor amnii becomes absorbed and the placenta disintegrates. Provided the cervix remains sealed the fœtus undergoes mummification.

Not infrequently, however, the cervix slowly opens (in my cases between the 73rd and 84th day) and the onset of parturition is indicated by the presence of a dark green, mucoid discharge at the vulva. Complete uterine inertia is usually present, the fœtus occupying a uterine horn, where it is inaccessible to forceps. Such a case is best relieved by prompt metrectomy.

The following are the details of a remarkable case illustrating this condition. (It has already been published in *The Veterinary Journal* (1934, Vol. 90, No. 1).

Subject:—8 y. o. Field Spaniel bitch.

Breeding History:—(1) In 1928, when three years old, the bitch whelped a single normal fœtus at full term. Parturition and lactation—normal.

(2) March 8th, 1933—Bitch pregnant with one fœtus. Period of gestation—74 days. Uterine cervix closed; no evidence of approaching parturition. Health normal. Cæsarian section performed and a dead, but sterile fœtus removed from the right horn.

(3) August, 1933. Bitch "accidentally" mated between the 8th and 21st.

December, 1933. Bitch pregnant with one fœtus. Period of gestation 106-119 days. Cervix closed. Health normal.

Hysterectomy performed. Right uterine horn gravid with fœtus undergoing mummification. The fœtal head was in the uterine body adjacent to the cervix—"butt" presentation.

The second type of uterine inertia is inertia of exhaustion. It occurs in the later stages of obstructive dystokia. The question arises, at what period after the commencement of parturition is inertia liable to set in? A dogmatic answer cannot be given as there will be considerable variation. Inertia is more likely to occur after death of the fœtus, for undoubtedly its reflex movements do much to assist the action of parturition. Death of the fœtus is dependent upon separation of the placenta. The mechanism controlling this factor is not understood. It is thought that hæmorrhage into the

villous spaces is the exciting cause, separation being assisted by the peristaltic contractions of the uterus.

The speaker's experience is that the first fœtus will remain alive for about four hours after delivery is due. The period elapsing between presentation and death in the subsequent fœtuses becomes progressively shorter, although the anterior fœtuses will probably be alive 12 hours or even longer after commencement of parturition.

Once fœtal death has occurred, putrefaction rapidly sets in, and intoxication of the musculature probably plays a contributory part in the inertia.

Acknowledgments.—I wish to express my grateful thanks to my colleagues, Mr. J. Paterson and Miss M. Oyler, for the great help they have given me in collecting data for this paper; to the members of the profession who have allowed me to observe their cases; and finally to my wife for the help she has given me with the diagrams.

. . . . .

No. 2—DELIVERY OF THE FOETUS

G. DUNLOP MARTIN, M.R.C.V.S.
Shenfield, Essex

I feel that all that is left for me, after the very able exposition you have heard from Professor Wright, is perhaps to ask you to go with me to a case, such as one frequently is called upon to undertake, in which there is difficulty in the delivery of the puppies. I will, therefore, take as an illustration a case in that frequent subject of dystokia, the Sealyham bitch.

One receives a message that the bitch has been noticed by the owner to have been in labour for an hour or two, that the owner is getting anxious and that one's attendance is required. The first thing to be done, I think, is to provide the necessary table and the necessary, more or less absorbent, material on which to put the bitch. Then you make your examination of the animal and endeavour to find the cause of the delay.

Professor Wright has enumerated the causes of delay and difficulty in parturition in the bitch so very well that I need not recapitulate them. You find, perhaps, that you have an anterior presentation, or maybe a "butt" presentation. If I may digress for a moment, may I say that one of the details that I think it is very desirable to carry out is to see that the posterior portion of the bitch is clean and, if she has a long, hairy coat, to cut the hair away for some inches round the vulva and then give her a good wash: for that purpose I like nothing better than some antiseptic soap—say, Lifebuoy, as being generally obtainable.

The next thing is to make a vaginal examination. You may find a "butt" presentation: you may feel only the crown of the head. The difficulty is to try and rectify the position of the puppy and you repel the puppy if you can. The bitch by this time is probably in a condition of inertia—*i.e.*, inertia of the womb, and one thing I am fond of giving at this period is a dose of gin, which I often find is useful in starting a certain amount of labour; it is given in milk—a teaspoonful to a dessertspoonful in three or four times that quantity of milk.

To revert to repulsion of the puppy—the immediate aim of your endeavour is, with your finger, to get the chin up above the brim of the pelvis, and if you are unable to effect this by manipulating with the finger you can often do so with a blunt hook if you can get it worked under the symphisis. By the same means one can sometimes get the fore-limbs into a more favourable position.

If, after you have waited a certain time—not too long—you find that you are unable to effect delivery with your fingers, endeavour to do so with forceps. An important feature of delivery with forceps is the necessity of knowing exactly the right amount of pressure the puppy's head will stand in order to effect delivery without at the same time crushing the head.

In the case of breech presentation, here again the difficulty is to rectify the position of the puppy. Sometimes you can assist the process of rectification by injecting a certain amount of sterilised oil, especially if the uterus and the fœtus have become dry, with the former more or less contracted on the latter. Again, in the case of breech presentation, the procedure is to repel the puppy with a view to getting the hind legs above the brim of the pelvis. Here you have your assistants supporting the bitch and endeavouring to help you by more or less massaging the abdomen with both hands, while you are helping the fœtus and the expulsive efforts of the bitch. I may say that the forceps I have found most useful when forceps have to be used are those designed by Professor Sir Frederick Hobday.

One of the greatest difficulties in dystokia is to decide as to whether you are going to be able to deliver the puppy by the vagina or whether it has gone beyond that possibility and is a case for Cæsarian section. I think one of the reasons for lack of success in Cæsarian section is that the operation is delayed too long—that the bitch is allowed to become too exhausted and consequently the shock of the operation and the anæsthetic is too much for her.

Professor Wright mentioned dropsy of the fœtus as one of the difficulties that may lead to dystokia, also hydrocephalus and, again, monstrosities. In the majority of these cases I think Cæsarian section is the only thing to be done. On the other hand, sometimes one is able to crush the head in the case of a monstrosity re-

sulting from an abnormality of the head, and then deliver the puppy by the vagina. Very often, also, you can relieve the dystokia, when you have to deal with a puppy that you have decided is already dead, by getting the limbs into a favourable position and then using the necessary force practically to perform embryotomy, delivery being completed by the use of forceps.

One great difficulty is in the neck of the uterus remaining closed, or where it is hardened. I do not mean exactly the stenosis to which Professor Wright referred, but simply that the neck of the uterus has not relaxed as it usually does. In such cases it is said, in descriptions of recorded cases, to be possible to dilate the vagina with a speculum and to use a probe-pointed bistoury in dealing with the unexpanded neck of the uterus. I have never done that myself, and I should have grave doubts as to the bitch living and the puppies being born alive.

I do not know that there is a great deal more to say with regard to the delivery of the fœtus except to state that it is very important, when traction has to be exerted with forceps, to use the greatest amount of traction in the strictest possible consistence with any efforts that may be made by the bitch herself; any little help that the bitch can give is very desirable.

The considerations attendant upon the indications for and the actual performance of the operation of hysterectomy or that of Cæsarian section are too well described in the text-books to require any remarks from me on this important feature of canine obstetrical work. I may say, however, that the after-care of the bitch in cases where it has been impossible to deliver the fœtus by the vagina is rather important, though this hardly comes under the subject of that portion of the discussion which has been entrusted to me. It is of the utmost importance to exercise the greatest possible cleanliness in these cases.

I do not think I have anything more to say, but I would like to close by reiterating somewhat more forcefully my regret at the often tragic difficulty created by the owner who is so anxious to "give the animal time." In my experience many animals are sacrificed through undue delay before operative interference.

Discussion

Major Hamilton Kirk said that he would like to compliment Professor Wright and Captain Dunlop Martin very heartily on bringing such an important matter before the Society, because it seemed to be impossible to find any literature or any text-book which would guide a practitioner on canine obstetrics. He could wish that Professor Wright would set about rectifying this omission in an even more thorough manner by producing such a text-book. (Hear, hear.)

The use of the epidiascope that evening was only another illustration of the necessity of the possession of an epidiascope by a society of that size: there were cases in which sketches and diagrams must be shown, and there was no other really satisfactory method of showing them.

Professor Wright had said that it was quite possible to diagnose pregnancy in the bitch at the 18th day. It might be a possibility, but he thought Professor Wright would agree with him that it was a very difficult thing to detect the presence of fœtuses at 18 days. He had also told them that the dimensions of the fœtus at that stage were 12 millimetres and, later, said that the dimensions of the bitch's teats were 10 millimetres, so that, in the speaker's view, if one had to feel about in the abdominal cavity for something approximately the size of the bitch's teat, it was more than likely that one would miss it. Personally, he found that the earliest time at which one could diagnose pregnancy with any certainty was about six weeks.

Then Professor Wright mentioned radiography. Some time ago he (Major Kirk) had to go in a hurry to see a cat at a client's house: they said that this cat was very ill, that it had swallowed a bone and had obstruction of the bowel, and wanted it X-rayed. He did so and saw two beautiful fœtuses in this cat, at the 50th day. Not only were the head and pelvis plainly visible, but the vertebral column and all the ribs: both kittens were coming tail first. That picture was exhibited at the Folkestone Congress.

As regards the use of instruments, there was a big danger that the instrument would catch up the lining membrane of the womb. If there was any fear of that having occurred, he liked to inject some warm glycerine, which was a good antiseptic and had no bad effect. He did not always get the degree of assistance from the use of pituitrin that he might have expected, and was told that in using ½ c.c. he was not employing anything like a large enough dose: a lady graduate had told them, at their last meeting that they could use 1½ c.c. with impunity, and with far better results.

He would like to know if anyone there had used Dupont's two-way tube, by means of which a wire could be passed in and round the head of the fœtus; the wire was then tightened and drawn upon. Had Professor Wright used it? Finally, could Professor Wright tell them how he could prognosticate whether the head of the first fœtus was too large for the pelvic entrance. How could one measure the width of the pelvis and the head of the fœtus? Perhaps he could give them some guidance on that.

Mr. Henry Gray, whose rising was made the occasion for a demonstration of regard in consequence of his return to the meetings of the Society after a prolonged period of absence through illness, said he thought it was only right that he should give the Fellows his experience because he believed that, with the exception of Professor Macqueen, he had been the longest in practice of anyone in that room and also was one of the first to turn his attention to practice among the smaller animals.

In his experience, a great deal of dystokia in the bitch was due to the state of the weather. That was a fact not only peculiar to the canine species: in cattle, sheep and even in birds in a state of confinement, when the wind was in the North—when it was chilly and wet at this time of the year—one met with any number of cases of dystokia or egg-binding, through weakness in muscular contractions. Chilliness paralysed or cramped the white muscular fibres. Even in horses colic was frequently due to that cause.

There was one thing Professor Wright had omitted to mention and that was the enzoötic form of dystokia in which most if not all of the bitches in an establishment had uterine inertia and dead pups. There was no means of inducing muscular contraction in those bitches. The only thing one could do was to try Cæsarian section or otherwise they would die from septicæmia. The essayist had also omitted to mention torsion of the uterus and he wanted to ask him why it was that those cases were more numerous in the cat than in the bitch. In his experience, such cases were only diagnosed on Cæsarian section.

One of the illustrations furnished by Professor Wright was of a puppy with a foreleg presented and its head turned towards the side of the body. That condition was very common, especially in small bitches and cats. They might also encounter the body in one horn and the head in the other. Such cases in small animals were easily treated, by manipulating towards the diaphragm the trunk of the fœtus through the abdominal wall with one hand and working the head backwards towards the vagina with the other hand.

As soon as one got the nose in reach one could put the finger in the mouth of the fœtus and pass a fine-curved hook of a long button-hook underneath the lower jaw and gently apply traction to it as the bitch strained

The use of simple instruments such as the button-hook, might be laughed at, but it had stood the test of time—or at least for nearly a century. But it was not so much the instruments used as the skill one possessed in one's work that mattered. (Hear, hear.)

Another thing he had found was one might be able to feel the head or mouth of the puppies very readily, but as soon as one inserted the finger into the vagina the puppies went forward towards the diaphragm. In such cases, especially in bull-bitches and other dogs with much intra-abdominal pressure, distended abdomens and powerful forward uterine contractions, one should put the bitch under the influence of chloroform and by manipulation through the abdominal wall fix the heads of the puppies and then use gentle traction. They easily came away when the uterine contractions returned. In such cases the difficulty was not always due to the size of the puppy, but to the lack of contraction of the uterine walls on the part of the mother towards the vagina.

Then sometimes one met with the case of the bitch dying from emaciation, when there were many puppies of a large size. The vagina was well dilated and the pups were easily removed. One must not forget that the fœtus was a parasite which lived on the dam and if she were not well fed and exercised she had not the power to expel the fœtus. One must not expect the uterine contractions to be more powerful than the strength or contractions of the heart.

On the whole, however, his experience of canine obstetrics had been one mass of contradictions. The older one got and the more experience one acquired the simpler one became in one's methods. In his experience, most of the instruments invented were of no use. One had to have skill, born of long experience. Patience was a great asset in a very large number of parturition cases.

Very often owners made a habit of coming at night time just when one was most tired and had no skilled assistant at hand. A skilled assistant was often a valuable asset, especially in fixing through the abdominal walls, so that the operator could fix the head with a button-hook or a simple form of forceps. In many cases in which the bitch and puppies seemed vigorous and the presenting pup (to the touch) was in the right position and one had plenty of patience it was not self-indulgence, but just common sense, to leave them alone for a time. In the majority of such instances the pups came away without any assistance.

Professor G. H. Wooldridge said that he thought he was voicing the opinions of all present when he said how indebted they were to Professor Wright for that pioneer work he was doing in connection with bitches and gestation. (Applause.) It had often been a matter of regret to him to realise the work in prognosis that could be carried out by the human obstetrician in regard to the fœtus and the probability of delivery, while the veterinary obstetrician was so often all at sea in these matters. They had been accustomed to think that their relatively unfavourable position in this regard was largely due to the enormous differences in size between the various small-animal patients. Professor Wright had shown them very well that night, however, by his diagrams and measurements, that there was a very definite relationship, that could in a very large number of cases be acted upon, between the size of the maternal pelvis and that of the fœtus, knowledge of which would enable one to give a better idea as to successful delivery on the part of the bitch.

He was prompted to those remarks by a case which came to him recently: a small terrier, said to have been mated seven weeks previously, and the owner was very emphatic that there was no possibility of any miscalculation. He found the bitch healthy and strong, showing few signs of approaching parturition. On examination he discovered that she was carrying several very large fœtuses and he had an X-ray taken. The heads were of such a size that they could be estimated in relation to the passage. Knowing that Professor Wright was working on these matters, he had already decided that, if the owner's history was correct, it was necessary to do hysterectomy or Cæsarian section. Accordingly, he submitted the case to him, together with the X-ray, and after examining both Professor Wright said that the puppies must be of eight-and-a-half weeks' gestation or thereabouts. In spite of that fact, in view of the history as given by the owner he (Professor Wooldridge) felt that hysterectomy must be carried out. That was done by Professor Wright himself, and four full-time live puppies were removed. That instance alone, he thought, emphasised the value of the observations that Professor Wright had made, because if one had dared to refuse to believe the owner one would have said that that bitch would, in all probaability, have whelped normally. That was only one example of the way in which that work could be put to good advantage when it got a little further developed.

He would like to refer to one other thing that Captain Dunlop Martin mentioned and which had also been referred to by Mr. Henry Gray, and that was the question of delay or urgency in dealing with many of these cases of bitches about to whelp. He thought that two opposing views had been expressed, Captain Dunlop Martin having spoken of urgency and Mr. Henry Gray having referred to the advantage of delay. His own experience was that both were right, but under different circumstances. One got bitches brought to one with the history that they were up to full time and the owner was very anxious because his bitch had not whelped. In many

of these cases if the bitch was well and strong he was convinced that delay was the right procedure, but the picture was entirely different when parturition had commenced, and then he thought delay was likely to prove fatal.

He begged to thank Professor Wright personally for the very excellent work he was doing.

Mr. R. F. Wall observed that the Society had listened that night to a most excellent paper and also to some very valuable discussion. Nevertheless, he would like to say this: that in his opinion and experience the examination of bitches to discover as to whether or not they were in whelp often led to subsequent trouble, and the advice he generally gave to his clients was that time would tell.

He would like to mention there a case that occurred to him, that was examined by a prominent member of that Society some years ago, by the speaker himself, and also by breeders of St. Bernards. A week before that bitch was due to whelp they all came to the conclusion that she was not in pup. Three days before she whelped they expressed the same opinion. The bitch delivered thirteen puppies without the slightest trouble. (Laughter.) He thought Professor Wright well hit the mark when he said "let well alone," but if parturition had started then it was time to interfere. He agreed with Professor Wright and other speakers that Cæsarian section should not be delayed. He had always found most successful the injection of either glycerine or sterile oil, and he would also like to support Mr. Henry Gray in what he had said about the use of chloroform; invariably when he had difficulty he put the bitch under chloroform, *i.e.* when one was not making much progress and there was a uterine contraction.

Of course they all agreed with cleanliness, but in some instances he thought it was carried a little bit too far, *viz.*, when some practitioners would irrigate the uterus after even a normal whelping; he thought that was contra-indicated and very bad practice.

He had to thank Professor Wright for making probably the first step that had been made in that direction.

Mr. J. D. Williams expressed the view that Professor Wright's paper was a very definite advance in canine obstetrics. (Hear, hear.)

Captain Dunlop Martin had recommended the injection of sterile oil, but the speaker had found some vegetable lubricants on the market to be of greater use, having a better lubricating action.

He was rather interested in that matter of anæsthesia during parturition. Could one anæsthetise a bitch with a number of puppies inside her and hope to get them alive?

Captain Dunlop Martin had mentioned monstrosities. What he (Mr. Williams) could not make out was how one was to determine whether or not there were monstrosities in the bitch; one could do so all right in the cow. Another thing that always amazed him was what abuse the uterus and the vagina could stand in whelping cases. One sometimes used a tremendous amount of traction and damaged the uterus to a great extent and yet the bitch recovered.

Professor Sir Frederick Hobday observed that as one listened to the opinions of the different speakers one came to the conclusion that, when all was said and done, each individual case had to be treated on its own merits; although, as someone had said, it was wise to have the knowledge and experience of others. One never knew when called in to a parturition case, especially when the subject was a round-headed dog such as a bulldog or pekingese, what one's experience was going to be. One should always carry forceps, but the most useful instruments of all were the fingers.

As regards the use of chloroform, his own experience had been that chloroform was useful for the last puppy or the last puppy or two, but its use in the early stages was apt to interfere with the delivery of the later puppies. It was of value when parturition was delayed or a help to remove a puppy that was obstructing the passage and thus to give the bitch a chance of expelling the others. They had heard pituitrin mentioned, and it had been stated that the dosage of one-half c.c. did not give quite the result that one would expect. He was one of the earliest to use pituitrin in canine obstetrics and his experience was that one c.c. given at once was much better than half a c.c. repeated. One c.c. was a perfectly safe dose to use for the average-sized small dog: he had never seen any bad results to follow that dose although he did not know what the actual toxic dose was. In his opinion, the injection of glycerine or petrolatum was better than that of olive oil: there was not the same risk of septic infection.

Torsion of the uterus—mentioned by Mr. Gray—was not at all common, but he did recollect one case. This did not cause any real trouble, however; it was found a long time after the proper time for parturition had elapsed, and the torsion must have taken place some time before and the uterine pains had subsided. He was surprised that no infection had taken place, and the torsion did not seem to have harmed the animal, except that a lump was palpable: that was why the laparotomy which discovered the condition, was performed.

The question of uterine inertia in a number of bitches in a kennel, also mentioned by Mr. Gray, was one met with every now and again, and he thought they used to meet with it more often in the past in bulldogs and foxhounds. He was sure that it was traceable to a wrong system of dietary, and he had seen excellent results follow on putting the bitches on to a higher vitamin-content dietary. One had been able to help the owner, by this means, to avoid a recurrence of this inertia of the womb and the consequent dystokia.

Mr. Henry Gray interpolated an enquiry as to why enzoötic puerperal fever in an establishment attacked one breed of bitch and left another breed alone? In his experience this type of disease continued for a long period, killing most of the attacked within three or four days. The bitches had their pups easily, but within 24 hours their temperatures rose.

He had, however, seen a single common-breed bitch give birth to pups without any assistance in a place where no other bitch or dog had been. She seemed apparently well for three or four days before showing any symptoms of illness and then rapidly showed the usual symptoms of parturient septicæmia and succumbed. On *post-mortem* examination the uterine mucous membrane showed necrotic patches of the circumference of a halfpenny. These patches extended to the serous membrane and had brought about perforation. No doubt the affected parts were those to which the placentulæ had been attached.

Mr. W. Perryman observed that it was his almost constant experience that canine obstetrical cases had been the subject of much interference prior to his arrival, when one found that the vagina was very swollen and painful; in fact,

almost impossible to touch. He had found it very useful to insert a little pad of cotton-wool soaked in cocaine solution: he thought, also, that it had a good effect in dilating the cervix, and even if it were absorbed it was something of a stimulant.

Captain Dunlop Martin had not said anything about the presentation in which the head was bent back and one leg was forward. One should secure the leg as firmly as possible before pushing it back again. One of the first things he did was to inject oil into the uterus, and the oil he used was olive.

Professor Dr. J. McCunn said that Professor Wright had introduced a very interesting subject and one which gave them more pitfalls than any other. He had divided the subject up, he thought, into ante-natal care and care during parturition. Taking ante-natal care first, that was work which, in his (the speaker's) view would be of great benefit to them. He was afraid it would not give them a great deal of help in the ordinary case that came to them, because then they had to deal with the mother at a time of urgency; they had to estimate things by the sense of touch and act accordingly. Professor Wright's work would be very helpful in the following way: if they knew that the puppies were of an abnormal size, that their heads or their hips were of a certain size, and they had also an estimate of the calibre of the mother's pelvis, they would know what to do. They would be able to bring on parturition, when necessary, a week earlier, because, as Professor Wright had rightly said, it was during the last period that development increased rapidly. In some of those cases to bring on parturition he had found that nothing could beat the use of quinine—gr. 30 a day—hot enemata and castor oil. It was surprising how, by these means, one could often bring away large puppies before they were fully developed.

The next point he would like to deal with was the diagnosis of pregnancy. He had "dropped many bricks" before he became a medical man, and one day his teacher in gynæcology gave him some advice which was very sound: "never give a positive diagnosis unless you can feel it." If his hearers acted up to that they would never "drop any bricks." He remembered one small bitch which to all intents and purposes was empty, and two days afterwards she gave birth to seven puppies; she was a small cross-bred terrier and the father was an Airedale.

Another point which arose was this: when a bitch was brought to him and she was near delivery he tried to establish whether he should interfere by the vagina or through the abdominal wall. If he was of the opinion that he could deliver these puppies by the vagina he set to work and got them out by that route, piece-meal if necessary. He knew very well that when there had been much manual interference or work with instruments, if he had eventually to resort to Cæsarian section he was going to have a dead dog; they would die two or three days afterwards, maybe before—everything might remain aseptic and then one could only ascribe death to shock. When he decided that the pelvis was not big enough to admit of the passage of the puppies he immediately resorted to Cæsarian section and not hysterectomy because in his experience the percentage of successes one got following Cæsarian section where one had proper conditions was much greater that the percentage of successes following a complete hysterectomy.

He subscribed absolutely to the view that one should not be in too much of a hurry. If one had got to deal with a bitch with wide tuber ischii and a wide crest of the ilium, in his opinion one could reckon that one had got a fairly normal pelvis. On the assumption that ninety per cent. of cases did pass their puppies correctly he thought it was best to leave nature with a chance to take its course in such a case. If there was any delay, however, he found it a very good plan to try and dilate the cervix and one could do that either with one's finger or with an instrument, the instrument he generally used being similar to a Hegar's dilator. The handle of a scalpel would do. It was the dilation and stimulation of the cervix which ruled the contraction of the uterus. If the cervix remained closed, the uterine contraction was not as great as when it was opening. It was surprising how much one could dilate the cervix.

The only other point which he would raise was to support Major Kirk in his use of glycerine. There was no need to carry out a lot of aseptic or antiseptic treatment in the parturition of bitches; use glycerine, and for that information they were indebted—and it ought to be put on record for the veterinary world—to the great work of Mr. Rimington Hobbs, who worked at the Paddington Infirmary; he was the great sponsor of glycerine as a gynæcological antiseptic. He (Dr. McCunn) knew that Mr. Hobbs had reduced the incidence of puerperal sepsis in women by the use of glycerine by somewhere in the region of 80 per cent. He was scoffed at for years by all the other gynæcological people, but his work had proved its value; unfortunately, Rimington Hobbs had come into his own only after his death. If any of them were in search of a lubricant which was also an antiseptic, for parturition or other cases, he should advise them to try glycerine; even after normal parturition the insertion of a little glycerine into the vagina or the uterus could not help but be a good thing.

Mr. J. W. Holmes observed that one of the points in Professor Wright's paper which interested him was the question of the size of puppies when there was disparity in the size of sire and dam. The essayist had said that when there was a single puppy then a large fœtus was the rule, but that with multiple puppies passage was usually easy. He had an excellent example of this in a Scottie mated to a sheep dog; she whelped down six puppies without any trouble. Another was a Peke, mated to a fox-terrier; she also had six puppies without any difficulty.

He would like to stress Major Kirk's point that the committee of the Society should consider the provision of epidiascopic facilities for the benefit of future speakers at meetings of the Central Veterinary Society.

The Replies

Professor Wright said that Major Kirk had doubted the possibility of recognising such small changes in the uterus as were present 18-21 days after mating. He wished it to be understood that these changes were not nebulous. When they embarked upon this work their first aim was to get a clear understanding of the size of the normal, non-gravid uterus, and a number of specimens were dissected. This was followed by specimens at various stages of pregnancy. Having made themselves familiar with the changes which the uterus undergoes during pregnancy, they were able to apply this knowledge when subsequently examining bitches which had been mated. They found that in small bitches (under 30 lbs.), at any rate, they could positively diagnose pregnancy at the 21st day. [Professor Wright turned to his colleague, Miss Oyler, who confirmed this.]

Regarding radiography; he would not accept radiographs of the cat as evidence of what could be demonstrated in the dog. One could get perfect pictures of cats, but he (Professor Wright) submitted that a radiograph of a 30-lb. bitch at full-term might show nothing, unless considerable technical expertness was acquired in this subject. The smaller the animal, the easier it was to show fœtuses by X-ray.

Major Kirk's third point was the tube and wire. There was no need to go to the Continent for such an instrument. Mr. Charles Roberts, of Tunbridge Wells, introduced a more ingenious instrument 20 years ago. It comprised a pair of forceps, the anterior ends of which were perforated. Through these "eyes" tape was threaded. The forceps were introduced into the uterus, closed, and directed over the fœtal skull. When in position they were opened, and passed downwards under the fœtal neck. In this way a noose was made around the head.

How did one, as an obstetrician, estimate as to whether a bitch had a reasonable chance of delivering the fœtus normally? It was his good fortune that most of the bitches with which he came in contact were comparatively small. By measurement of the ischial tubers, and a digital examination of the pelvic inlet, per rectum, one could arrive at a sound opinion regarding the bitch's pelvis. He claimed that one could, by palpation through the abdominal wall, immediately in front of the pelvic brim, fix the head of the fœtus between the fingers. By so doing a reasonable estimate of its size could be obtained.

Mr. Henry Gray, whom they were all delighted to see there that evening, after his splendid recovery from a serious operation (applause), had referred to enzoötic dystokia. Sir Frederick Hobday had made reference to dietary deficiency in this connection. Calcium deficiency was highly popular these days, and as muscular contraction was dependent upon a sufficiency of calcium, its deficiency might be a cause of dystokia. His own view was that it was improbable that a dog under present-day conditions of life would have a calcium-deficient diet. His advice was—always keep a pregnant animal in hard condition; give her exactly the same exercise as if she were not pregnant, for proper muscle tone was of great importance at parturition. He agreed with Mr. Gray that transverse presentation—the head, or some other part of the fœtus, passing into the other horn—was not uncommon. It caused a serious form of dystokia.

With regard to Major Wall's St. Bernard bitch, he agreed that such a large animal was hard to handle, but he would suggest that when examining a bitch in the later stages of pregnancy, one should palpate, not the pendulous portion of the abdomen, but well up, immediately in front of the pelvic brim.

He was in agreement with Captain Stow that the chest was usually the largest part of the fœtus, and in cases of posterior presentation particularly, it was likely to cause dystokia. As to the result of traction, it would depend, to a great degree, upon the viability of the fœtus. A living, or recently dead fœtus, could withstand any amount of traction without breaking. A putrid fœtus, however, broke very quickly. This was one of the reasons why he was an upholder of early interference in dystokia.

The aspects of the subject with which he dealt referred exclusively to diagnosis and gestation, so that it was not incumbent upon him to answer questions regarding prognosis, etc. There was, however, one point upon which he wished to speak. Dr. McCunn had spoken of dilating the cervix. He, Professor Wright, would sound a note of warning. In the non-pregnant animal, and in the pregnant one up to the very late stages, the cervix was a structure not so large as a pea (about 5 mm. long). Its orifice was so small that one could not introduce the ordinary silver probe into it. It was situated inside the abdomen (not in the pelvis as in the large animals and in women) from 6-10 inches from the vulva. It was impossible completely to dilate the bitch's vagina with a speculum.

For these reasons great care would be necessary if it was proposed to interfere with the cervix.

Captain Dunlop Martin, who also replied briefly, said that there was just one point that occurred to him in regard to the discussion that had taken place, and that was that most of the speakers who recomended waiting and delay in the matter of parturition were referring rather to physiological parturition than to dystokia, and he thought that should be borne in mind.

With regard to the question of vitamin deficiency and so on, there was a great deal of discussion and research concerning calcium. He believed it to be considered by many people, with regard to work in the human being, at any rate, that a large portion of the troubles associated with parturition in the human female were due to a blood-calcium deficiency and that if that could be remedied and the normal blood-calcium could be maintained, the chances were that parturition would be very much more normal and that the troubles associated therewith would be greatly diminished both in frequency and gravity. That was with regard to the mother. With regard to the young, they would be born alive, with better bone, and consequently less liable to rickets, while they would possess a greater resistance to disease generally and consequently a greater chance of survival.

. . . . .

Dr. McCunn asked to be allowed to reply to Professor Wright's statement that he could not see how he (Dr. McCunn) could dilate the cervix, as it was in the belly beyond the end of the finger: he wanted to correct a misconception by Professor Wright of his remarks on that point.

Dr. McCunn acknowledged that, in the normal uterus, or in the uterus not near the parturient state, the cervix was as Professor Wright had described, but when the first stage of parturition commenced the cervix was pushed back and then it could be easily felt. In the majority of cases it was open to a greater or lesser degree and when competely open it was to all intents obliterated. Its site could only be located by a rim or ridge, the uterus and vagina being merged into one another. Stimulation of this part would promote uterine contraction.

Dr. McCunn added that he would not attempt to open a closed cervix—it would not be good practice, for risks were too great; moreover, by virtue of its position, etc., it would be almost impossible to do so.

[Professor Wright nodded agreement when he heard the explanation.]

The Government of the Union of South Africa announces that the period of quarantine on arrival in the Union imposed on sheep, goats and swine imported from Great Britain or Ireland, has been reduced from 30 days to 14 days.

INTERNATIONAL CONGRESS NOTES

"Little Journeys"

Undoubtedly veterinarians from overseas who attend the 12th International Veterinary Congress in New York City next August, will be making the journey principally because of the superlative programme the Congress will afford. But it will be a mistake for anyone making the trip, particularly anyone making his first trip to America, to fail to spend some time in viewing some parts of the country, its people and their institutions, which differ in so many respects from those of older parts of the world. Although New York City is remote from the stupendous natural scenic attractions with which the North American continent is more plentifully supplied than any other, there is much, very much, to be seen locally, or within a short distance, that is regarded by world travellers as possessing great interest.

The eastern mountains of the United States do not possess the magnificent grandeur of the western ranges, nor the lesser ruggedness of the Alps, but the scenes they afford are truly mountainous and surpassingly beautiful. Just a short journey by boat up the Hudson River and a shorter trip by motor 'bus will take the tourists into the heart of the Adirondacks, a region of surprisingly beautiful natural scenery —mountains, rivers and lakes, with lodges furnishing every possible comfort, convenience and luxury—to mention one of many scenic trips from which the tourist may select.

If the visitor be interested in the marvellous development of education in the New World, a journey of six hours or less will take him to such famous universities as Harvard, Yale, Dartmouth, Johns Hopkins, Princeton, University of Pennsylvania, and many others.

The famous Walker-Gordon farms at Plainsboro', New Jersey, are only an hour's ride by motor from New York City. More certified milk is produced at this plant than at any other, and of a grade probably not attained by any other large source of production in the States.

In this plant, a part of the herd is milked in a "rotolactor," an immense revolving platform, 60 feet in diameter and containing 50 stalls, to which the cows are driven and stanchioned, washed, dried, milked, and the milk weighed, recorded and bottled—all by machinery—as the rotolactor slowly revolves, requiring twelve and one-half minutes to make one revolution, which suffices to milk 50 cows. The rotolactor does not stop, but takes on and discharges the cows continuously, one every 15 seconds. Two thousand cows are milked in this machine three times daily. The milk does not come in contact with free air.

A six-hour trip by train will take visitors to Ithaca, New York, the location of Cornell University, which includes the New York State Veterinary College. The campus of Cornell University has been pronounced by competent judges the most beautiful college campus in the world. The setting amidst mirror-like lakes, plunging cascades, and deep, darkly wooded glens, is most attractive. Any veterinary college interests the visiting veterinarian, and of particular interest is the New York State Veterinary College because of its great influence on the development of veterinary medicine in this country—an influence extending over a period of almost 70 years.

Nor, though made in the New World, need these journeys be devoid of historical interest. At Jamestown one may see the site of the first settlement of English pioneers in what is now continental United States—a settlement more than 300 years old; and, at nearby Williamsberg, a village restored to the exact condition—residences, furnishings, stores and streets—of colonial times. Here one may see in its beginning the actual process of creating a nation from a wilderness. In New York City, the Bowery still retains the name, as it occupies the site of the official residence of the early Dutch Governors of New York (then New Amsterdam) of the seventeenth century.

A half-day journey from New York City by train will take the visitor to Washington, that marvellous city on the Potomac, planned by a famous European artist and laid out by General Washington. It matters not how nationalistic the visitor be, he cannot escape a thrill in walking down Pennsylvania Avenue from the Capitol to the White House, and realising that the whole government of a nation of 130 million people is centred there; and that the government is wholly of the people's own making and their's is the privilege of changing it whenever they see fit—a thing they frequently do. There is no veterinarian but must experience a feeling of pride in visiting the Bureau of Animal industry in Washington and realising that it is a strictly veterinary organisation from Doctor Mohler, its head, to the inspectors in the field, some of them three thousand miles away; and that it has a record of achievement in disease control not equalled by any other organisation in the control of disease in animals, in man or in plants.

At the request of the President of the British Association of Refrigeration, arrangements have been made for a second refresher course on the Biological Aspect of Refrigeration and other Methods of Food Preservation to be held at the Low Temperature Research Station, Cambridge, for one week, beginning July 23rd. A fee of 30s. for the whole course will be charged to cover expenses. Owing to lack of accommodation, the numbers will be limited to thirty. Those wishing to attend the course, therefore, should notify Mr. J. Raymond, Hon. Secretary of the British Association of Refrigeration, Empire House, St. Martin's-le-Grand, London, E.C.1, as soon as possible.

Clinical Communication

ANAESTHESIA IN THE DOG BY INTRAVENOUS INJECTION OF EVIPAN SODIUM*

LINDSAY AUCHTERLONIE, M.R.C.V.S.
NOTTINGHAM.

Evipan sodium is a soluble salt of a new barbituric acid derivative, pharmacologically characterised by rapid onset, depth, and short duration of its anæsthetic action. Its discovery was the culmination of a search for a drug which would minimise unnecessary worry, fear and anxiety in those about to undergo minor operations and its growing use in human anæsthesia appears to be general.

While the psychic factor does not enter into veterinary work to the same degree as in human surgery, yet the pharmacological characteristics of the drug undoubtedly made a trial of it worth while in dogs. It is not meant to be a basal narcotic like avertin, but to provide in itself full anæsthesia.

Messrs. Bayer kindly made me a present of 10 grammes and I commenced using it early in February.

It is readily admitted that all cases selected for trial were not necessarily those which justified complete anæsthesia, but the anæsthesia produced made the examination or operation delightful to perform.

Trial has been made in 14 cases. There were three failures due to underdosing; two of these were caused partly by inability through inexperience to keep the needle in the vein and partly by movement of the patient. The third (Case No. 5), was due to deliberate departure from the calculated dose. The first two failures did not hold up the operations as the induction of ether anæsthesia is always arranged for beforehand.

The third case allowed of a tonsil being enucleated with the patient partially conscious. The remaining 11 cases were an unqualified success and complete anæsthesia resulted.

Preparation of Patient

1. Preliminary fasting for several hours.

2. If pre-medication with a sedative is used, it should be carried out at least one hour beforehand. This was only resorted to in the most recent case (No. 14), the Roche ampoule containing omnopon gr. $\frac{2}{3}$ and scopolamin gr. $\frac{1}{150}$ being injected with good results. (Jarman & Abel, *Lancet*, March 10th, 1934.) It was decided to refrain from using morphine because of previous experience of its uncertain action.

3. Shaving of the skin above the hock on its outer aspect to render visible the external saphena vein.

. . . . .

Administration of Evipan

Solution of evipan (1 gramme in 10 c.c. of distilled water) is made up and put into a 10 c.c. syringe to which is attached a keen-pointed, short needle.

The dog is weighed (by suspension in a sling hung on to an ordinary spring balance). The dose is calculated at 2 c.c. for each 10 lb. of body-weight (the estimated dose), but as yet no reliable data are available.

If the anæsthetist is also to be the operator, disinfection of hands is carried out before injection is made and a pair of cotton gloves put on. Owing to the transient nature of anæsthesia no interval can be allowed for disinfection after completion of injection.

The dog is secured on its side as follows:—

(*a*) A three-inch crêpe bandage is passed between the hind legs, over the loins and tied to the table leg.

(*b*) The lower hind paw is fastened to the table so that the leg is held extended.

(*c*) Assistant No. 1 holds the head and fore limbs and also observes head signs.

(*d*) Assistant No. 2 grasps the upper hind limb firmly well above the hock, thus distending the vein.

(*e*) The anæsthetist applies the special apparatus which holds the syringe (see photograph) to the region of the tarsus and metatarsus and grasps the paw and apparatus with the left hand (palm uppermost).

He then inserts the needle and tubing connecting it with the syringe under a thin rubber band above the tarsus to hold the tubing straight.

Everything is now ready for the puncturing of the vein, and when this is accomplished a stream of blood shows through the thin wall of the rubber tubing and the anæsthetist calls "Injection commenced."

(*f*) Assistant No. 2 relaxes his grasp of the limb and starts a stop watch, counting seconds aloud.

In the first thirteen cases a routine rate of injection was adhered to of 1 c.c. every 15 seconds. This was based on earlier recommendations (*Clinical Excerpts*, Vol. VIII., Nos. 7 and 8), but in case No. 14 the injection was completed in 35 seconds without unfavourable signs. Jarman & Abel, *Lancet* (*idem*), however, state that after two or three c.cs. have been injected a pause of 30 seconds should be made before giving the remainder.

(*g*) Assistant No. 1 looks out for yawning, and eventual relaxation of the lower jaw and calls out as these signs occur (which are noted by No. 2 on paper). He also inserts a mouth

* Received through Captain O. V. Gunning, D.V.M. (Ohio), M.R.C.V.S., *Veterinary Record* Representative, Derbyshire Division, N.V.M.A.

gag and clips the tongue forward to provide a good airway.

[In human practice it is customary to regard dropping of the jaw as the criterion of anæsthesia and the amount of subsequent injection is based thereon, but with "all hands at the wheel" and only two assistants it was not possible in these cases to do more than adhere to a plan and record a few phenomena.]

The moment injection is completed the anæsthetist shakes off the cotton gloves and is ready to operate.

Case Record

The following is a record of a typical case:—

Case No. 8. 8 yrs., fox terrier, male. Weight 30 lbs. Dose 6 c.c. *Normal respiration* (32), pulse 93, temperature 102°F. 55 *secs.*, jaw relaxed. 87 *secs.*, injection completed. 90 *secs.*, reflexes gone. 3 *mins.*, operation begun. 4 *mins.*, deep sigh during cutting. (The only case in which this was observed.) 6 *mins.*, respirations 23 and shallow. (Frequently in the early stages threatened apnœa appears to be supervening, but CO_2 was never necessary.) 11 *mins.*, respiration 24. 13 *mins.*, reflexes returning. 14 *mins.*, operation finished. 15 *mins.*, whining. 19 *mins.*, pulse 140. 24 *mins.*, respirations 18, temperature 100. 25 *mins.*, knee jerk well marked. 27 *mins.*, muscular twitching. 56 *mins.*, moving legs and whining (dreaming), temperature 99. 60 *mins.*, raised head, still whining. 65 *mins.*, settled down on being talked to and went to sleep. 70 *mins.*, lifting head and moving fore legs. 75 *mins.* asleep. 90 *mins.*, intermittent howling and violent tetanic spasms with fore legs straight and neck arched backwards. 115 *mins.*, less violent whining. 2 *hrs.*, 10 *mins.*, put dog in sack tied at neck with head out. (This is now the usual practice; it prevents much movement and disarrangement of bedding and injury to head.) Very little trouble after this. 4 *hrs.*, asleep. 5½ *hrs.*, slight excitement. 6 *hrs.* 20 *mins.*, trying to stand. Taken out of sack and drank some water.

The cases selected were:—

No. 1. Aged dachshund, in feeble condition from a very septic mouth in which portions of premaxilla and maxilla were sequestra. A dental surgeon, Mr. Roland Faure, operated. Weight 18½ lbs. Dose 3½ c.c.

No. 2. Aberdeen terrier, six years, for examination of a very tense abdomen associated with much pain. Weight 30 lbs. Dose (not according to scale) 3 c.c.

No. 3. Sealyham bitch, 18 months, for evisceration of eye (glaucoma). Weight 22 lbs. Failure. (Ether anæsthesia.)

No. 4. Fox terrier, 7 years (very nervous), for tumour on lower jaw, involving also removal of incisor teeth. Weight 25 lbs. Only 4 c.c. given. Estimated dose 5 c.c.

No. 5. Airedale, 7 months. Flap amputation of tail. Weight 36 lbs. Estimated dose 7·2 c.c., 5 c.c. given. Failure. (Ether anæsthesia.)

No. 6. Cross-bred terrier, 4 months. Flap amputation of tail. Weight 15 lbs. Estimated dose 3 c.c., 3½ c.c. given.

No. 7. Fox terrier, 7 months, for bilateral entropion operation. Weight 26 lbs. Estimated dose 5·2 c.c., 7½ c.c. given.

No. 8. Fox terrier, 8 years, large tumour on scrotum. Weight 30 lbs. Estimated dose, 6 c.c.

No. 9. Poodle, 10 years (nasty to handle), for examination and report on very large scrotal tumour. Weight 42 lbs. Estimated dose 8 c.c. 7 c.c. given because of the dog being feeble. This dog was subject to bouts of coughing and falling down, and though a diagnosis of heart disease could not be made by auscultation, disorderly action was present. Three hours later the animal stood up and wagged his tail.

No. 10. Sealyham, 8 years. Eye evisceration for perforated corneal ulcer. Weight 35 lbs. Estimated dose 7 c.c.

No. 11. Spaniel, 9 years. Difficulty in getting thorough examination of throat (dysphagia extending over three months). Tonsillectomy. Weight 34 lbs. Estimated dose 7 c.c. Needle came out at 4 c.c. Semi-failure.

No. 12. Fox terrier, 2 years. Congenital narrow eye-slit with bilateral entropion. Weight 20 lbs. Estimated dose 4 c.c.

No. 13. Chow, 6 months. Bilateral entropion. Weight 38 lbs. Estimated dose 6·8 c.c.

No. 14. Kerry Blue bitch, 17 months. Bilateral entropion. Weight 37 lbs. Estimated dose 7 c.c. Pre-medication by hypodermic injection of the contents of the Hoffman La Roche ampoule (before mentioned) one hour previous to evipan injection.

This resulted in the bitch coming to the operating table in a placid state without any of the jerkings commonly associated with morphine. The intravenous injection was completed in 35 seconds and the jaw dropped at the 55th second. There was no jactitation encountered in this case and the bitch was put in a sack 3½ hours later (for the night). The next morning she was quite quiet and was taken out of the sack, when she immediately stood up.

For this case, use was made for the first time of the apparatus for holding the syringe and the limb, and I think that it should render much more easy the operation of intravenous medication.

ADVANTAGES OF EVIPAN ANÆSTHESIA

This somewhat cursory paper only embraces a very few instances of the use of evipan sodium, but it has been written in the hope that other veterinary surgeons will make trial of its use, and record their experiences. As far as conclusions can be drawn from so few cases, the advantages of evipan anæsthesia in dogs may be described as:—

1. Once a routine has been developed it is easy to establish it.
2. Even with a feeble patient it appears to be quite safe. (Cases 1 and 9.)
3. Action on heart does not appear to be drastic.
4. For operations on the head there is no mask to get in the way.
5. Only one assistant at the operation is necessary after completion of injection.
6. If a hitch occurs in puncturing the vein, either injection can be made higher up the leg or the dog can be turned over and the other vein used. (This occurred in case 13.) Any subcutaneous leakage can be dealt with by immediate firm bandaging with no after effects.
7. Patient commonly fit to go home within six hours of anæsthesia, *i.e.*, in those cases which are not pre-medicated.

DISADVANTAGES OF EVIPAN ANÆSTHESIA

1. Difficulty in guaranteeing that the patient will keep still while injection is in progress. (Pre-medication will minimise movements.)
2. Difficulty in short-legged breeds in making an intravenous injection, which may be overcome with more practice.
3. Occasional violent excitement and movements some time after operation is completed. (Pre-medication may be the solution of this problem.)

The occurrence of this during the early stages is a sign of under-dosing or a too slow rate of injection (cases 3, 5 and 11).

Occurring during the post-operative stage it can be mitigated by enveloping the dog in a sack, as previously mentioned.

4. It is expensive. 1 gram phial costs about 2s. 4d., and what is left over of the solution may not be used after 3 to 4 hours.
5. It can only be used for minor operations occupying less than 15 minutes, but recent work by Jarman and Abel indicates that a second injection may be given to prolong the anæsthesia. In any case, a considerable amount of suturing can be done while the dog is under the initial dose, long after reflexes have returned.

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The Method of Holding the Syringe

For cases 1 to 13 the needle was directly connected to the syringe and held in the left hand.

If *any* movement of the limb occurred there was usually a break in the continuity of the injection through the needle coming out of the

vein. To minimise this risk a simple device was employed. A short portion of the thick double rubber tubing used in the automatic milking machines was split open along the length of both tubes. The large calibre tube, spread open, was used to embrace the limb, and the narrow one, similarly opened, effectively held the barrel of the syringe. A short length of clear bicycle valve rubber was used to connect the syringe and needle.

To prevent side movement of this tubing a narrow rubber band was placed above the hock under which the tubing was inserted.

By this method any movement of the limb was accompanied by the hand and the syringe, the needle remaining stationary.

Should this prove consistently effective, arrangements will be made to have a proper appliance manufactured in two sizes, *viz.*, for large and for small dogs.

The Needle

No other than a keen-pointed needle is of use for intravenous injection.

The author has familiarised himself with the technique of sharpening his own needles. The ordinary hone can be modified by the use of emery paper to have one edge rounded off. By this method the sickle point can be obtained, and a lens should be used to scrutinise the result obtained.

The needle should be sharpened for each injection.

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ADDENDUM

While reading the proofs of this paper the author has decided to include the details of a single case of the use of a second dose of evipan.

The syringe and holder were bandaged to the limb and the needle was left in the vein after the initial dose had been given.

Subject.—Irish terrier bitch, 11 years. Condition poor. For examination of the throat. This bitch had been showing dysphagia for several months.

Weight 20 lbs. *Estimated dose* 4 c.c. 2 c.c. given in 20 seconds. *Jaw dropped* at 30 seconds, when another c.c. was given. This resulted in complete loss of reflexes till 3 minutes 40 seconds, when the remaining c.c. was injected. Reflexes again rapidly disappeared until 13 minutes later.

The first chimpanzee born in England, so far as can be ascertained, arrived at Clifton Zoological Gardens, Bristol, on May 9th. Betty, the mother, who is eleven years old, has been at Clifton for five years. Both are reported to be doing well, and if the baby is successfully reared it will be the first chimpanzee on record reared in Europe.

Abstracts

[**Experimental Distemper as a Weapon in Combating the Disease.** (Trans. title.) Lehnert, E. (1933.) *Meddelanden från Statens veterinarbakteriologiska anstalt,* 108, 2 tables, 25 refs. Summary in English.]

The literature of distemper immunisation, so far as it concerns the use of killed virus and living virus obtained from organs that contained the specific ultra-visible, filterable distemper virus, is reviewed.

An account is given of the results obtained by the author in experiments on dogs, using devitalised virus in a 10 per cent. organ-emulsion sterilised by boiling. One injection, subcutaneously, of this material—alternatively, two injections, the interval being three days—yielded evident immunity against a subsequent injection with living distemper virus. The periods elapsing between the injection of the emulsion and that of the virus ranged from three to 28 days—a longer period has not been tested.

W. B.

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[**Non-tuberculous Osteoperiostitis in the Dog.** (Trans. title.) Robin, V., and Brion, A. (1933.) *Bull. de l'Acad. Vét. 6.* 9. 418-423.]

Diffuse osteoperiostitis is described as deformity of the limb bones by periosteal proliferations that are often confluent. It was generally considered to coincide with tuberculosis, but Cadiot suggested it might occur in the course of other chronic diseases. The present writers record two cases. In the first case an eight-year-old dog developed progressive and symmetrical lesions which finally rendered movement almost impossible. The dog was destroyed and no tuberculous lesions were found. The periosteal proliferation of the metacarpal region was such that the circumference of the bones was quite three times the normal, and after being boiled out presented an irregular and spongy appearance. Three guinea pigs were inoculated with crushed bone and marrow, and when killed six months later were found free from tuberculosis. The second case also occurred in an eight-year-old dog, which was, in addition, affected with a mammary tumour of the size of a fist. The dog did not react to the tuberculin test and was destroyed. No visceral lesions were found. The mammary tumour consisted of a hard fibrous capsule with a yellowish purulent centre and was, in reality, a chronic abscess. Guinea pigs were inoculated with material from the abscess and the diseased bones and bone marrow, but on slaughter in due course were found free from tuberculosis.

The authors review other records of the same condition, and conclude that it is most probably connected with chronic cachectic states such as

are associated with neoplasms, encysted suppurations, chronic nephritis, old age and worm infestations which may upset the mineral metabolism of the body and thus the nutrition of the osseous system. J. S.

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[Some Dental Affections in the Dog. (Trans. title.) Dechambre, E. (1933.) *Bull. de l'Acad. Vét. 6.* 7. 314-318.]

After a brief mention of gingivitis, which usually develops under thick deposits of tartar and often results in a fœtid and copious pyorrhœa that may be the starting point of intestinal or general infections, Dechambre relates details of two cases of Dental Caries, which is much less common in dogs. Caries may be recognised by dark marks or cavity formation in the enamel, generally where folds occur. The affected teeth may be painful to percussion and the dog's ability to eat may be affected. In both the cases here recorded recovery followed extraction of the affected teeth.

Necrosis of the Mandible.—This condition was met in a three-year-old dog in poor condition and with capricious appetite. The gum was found to be separated from the left lower back molars almost down to the lower border of the mandible. It was decided to extract both teeth, but this proved most difficult and a gouge had to be used. The mandible appeared very white and hard, and it was curetted until a healthy surface showed. Fortunately, only the outer half of the mandible was affected and a bridge of healthy bone remained on the inner face. The dog was kept muzzled and fed on liquids, and after three weeks was going on well. Unfortunately it then obtained access to a bone and fractured its jaw. This however, was successfully set and the dog made a complete recovery.

Atrophy of the Tooth Roots.—An example of this occurred in a four-year-old dog which showed no marked abnormality when destroyed. The condition was noticed when the skull was macerated and the teeth became detached owing to almost complete atrophy of their roots. No cause could be found for the lesions, though the suggestion of a dental specialist was that it may have been due to a severe infection during puppyhood that affected the general health and caused atrophy of the permanent tooth germs. J. S.

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[The Treatment of Non-Parasitic External Otitis in the Dog. Srnetz, A. (1933.) *Prag. Archiv. f. Tiermed.* No. 718.]

A very detailed monograph with a long reference list by the Assistant of the Surgical Clinic at Brno Veterinary College.

The chief cause of external otitis is stated to be dirt accumulation in the external meatus; dogs with pendant ear flaps are more liable to become affected than those with small erect ears. Dogs with cropped ears seldom appear at the author's clinic for treatment. If water gets into dogs' ears during a bath it causes inflammation and when that has begun the condition automatically becomes worse and severe cases can only be cured by very painstaking treatment. External otitis is said to follow an attack of distemper.

Ear mites seldom cause otitis in dogs (100 consecutive author's cases all negative; 17 per cent. of cases seen at Berlin Veterinary College over two years), but are the cause in all cases in cats and rabbits. Von Düring observed a seasonal incidence in canine parasitic otitis, most cases occurring in the winter months.

The symptoms are too well known to require an account here.

The main part of the article concerns treatment and the author has tried numerous methods (including watery, alcoholic, oily, fatty and powdery applications), has used local anæsthetic drugs, operative treatment, non-specific stimulation therapy, pyotherapy, arsenicals and fœtal skin extract. His final method indicates that most careful attention to cleaning out the ear at very short intervals is of the greatest importance and that the drug preparations used are relatively unimportant.

It is necessary to use special forceps ending in fine points not more than 1·5 m.m. wide wrapped round with cotton wool in such a way to form a 5 cm.-long wool probe protruding beyond the end of the forceps, firm enough to withstand crumpling and soft enough to avoid the risk of injury. Detailed instructions for the wrapping of the cotton wool are given. Success in treatment largely depends on this instrument. The interior of the ear is well exposed; the outer parts are first well cleaned with dry cotton wool, then the inner part is similarly cleaned, then the interior is to be wiped with fresh wool dipped in one-half per cent. silver nitrate. Alcohol (40 per cent.) is only used when crusts have to be softened for removal. The ear must then be thoroughly dried by more changes of cotton wool. In slight or moderate cases nothing further is done but the above treatment is applied three times daily to start with, gradually extending the intervals as the case progresses. If there is much loss of epithelium a little ichthyol ointment is applied [scarlet red, as "pellidol," is good] and nodular growths are either cut off by scissors or cauterised. The important point is to keep the ear dry and clean.

In addition it is important to attend to the dog's general health.

Srnetz refers to the slitting open of the ear to facilitate access to the diseased inner part, though he does not mention the removal of a triangular piece of cartilage from the concha. J. E.

[The Diagnosis and Incidence of Ascariasis in Dogs. (Trans. title.) Schulz. (1933.) *Tier. Rund., 39,* 47, 779.]*

Schulz draws attention to the importance of ascarids in causing disease in young dogs. An examination in Berlin of the fæces of 942 dogs showed an incidence of 45·5 per cent. in whelps up to 3 months old, declining to 1·7 per cent. in dogs between 2 and 3 years old. The average incidence was 13·9 per cent. These ascarids not only compete with their host for the available food supply, but also exert a very harmful effect by means of toxic substances which they elaborate.

B. G. P.

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[The Resistance of the Eggs and Larvæ of Swine Kidney Worm, *Stephanurus dentatus* Diesing, with special reference to the Control of Stephanuriasis. Jesus, Z. de. (1933.) *Philippine Agriculturist, 21,* 10, 677-694.]*

Jesus describes experiments which he has carried out to determine the resistance of eggs and larvæ of *Stephanurus dentatus* to various conditions with a view to finding some practical methods of controlling Stephanuriasis by using cheap and easily obtainable materials.

Eggs lost their vitality after an exposure of (*a*) 24 hours to a 4 per cent. solution of crude common salt, (*b*) 24 hours to a 1:10,000 solution of commercial quality copper sulphate, and (*c*) 15-30 minutes to a 1 per cent. solution of creolin (Jeyes' fluid). Larvæ, of the pre-infective stage, were killed after an exposure of (*a*) 11 hours to a 3 per cent. solution of crude common salt, (*b*) 20 hours to a 1:10,000 solution of copper sulphate, and (*c*) 15-30 minutes to a 1 per cent. solution of creolin. Exposure of eggs to dryness in bright sunshine for 30 minutes and in the shade for 9 hours also destroyed their vitality.

The author concludes, on the basis of his experimental data, that for spraying wet places in pig pens a 5 per cent. solution of crude common salt or a 1:5,000 solution of copper sulphate should be used to give allowance for dilution. Further, the use of solutions of creolin, for spraying, and of common salt (4 per cent.) or copper sulphate (1:10,000) in mud holes and wallows in pig pens will be effective if repeated every four days. The author also determined the longevity of the infective larvæ to be 56 days or probably longer under more favourable conditions.

J. N. O.

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[Eosinophilia in the Blood of Swine due to Trichinosis. (Trans. title.) Maass, Z. J. (1933.) *Zbl. Bakt.,* 1 Abt. Orig., *129,* 1/2, 29-34.]*

Maass gives the results of daily blood examinations of 9 pigs, 8 of which had been experimentally infested with *Trichinella.* The results show that an eosinophilia is produced which is maximal at about three weeks after infestation and which is roughly proportional to the intensity of infestation.

The normal percentage of eosinophiles in the pig has been placed as high as 8; Maass finds it to vary between 0.5 and 4.5. In two pigs fed with 100 larvæ the maximum eosinophilia was 10 per cent.; in two fed with 200 larvæ, 12.5 per cent.; in two fed with 1,000 larvæ, 20 per cent.; and in two fed with 5,000 larvæ, 27.5 per cent. There was an abrupt fall within the 24 hours after the maximum, followed by a more gradual return to normal. Quantitatively, the leucocyte count was usually doubled within the first three weeks.

B. G. P.

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[Effectiveness of the Swine Sanitation System in the South. Nighbert, E. M. and Connelly, J. W. (1933.) Tech. Bull., U.S. Dept. Agric. No. 374, 14 pp.]*

Nighbert and Connelly have examined the effectiveness of the McLean system of swine sanitation with modifications which mainly consist in farrowing both spring and autumn litters on pasture in temporary shelters rather than in permanent farrowing houses.

Under their modified system sows produced 6.5 pigs per litter; the daily average gains were 0.63 lbs. and, excluding accidental deaths, only 5.5 per cent. were lost. Control sows produced 6.0 pigs per litter, with average daily gains of 0.57 lbs., while 18 per cent. were lost from disease. *Post-mortem* examinations showed 75.2 and 93.5 per cent. of parasitised livers, 31.8 and 49.7 per cent. kidney worm infestation, and 76.3 and 82.9 per cent. ascarid infestation respectively in "sanitation" and "control" animals.

B. G. P.

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[Experimental Application of the Antagonism between the Male and Female Gonads to Therapeutics. (Trans. title.) Ruegg, J. *Schweiz. Archiv. f. Tierhlk.* 434. *76.* 1.]

A collection of case records of nymphomania in the mare and nymphomania and ovarian irregularity in the cow, treated by the oral administration of dried ox testicle tissue.

Details of the equine cases are not given, but improvement after treatment was recorded in 16 cases, some of which relapsed, and failure in 15 cases. The author states that early and slight cases are more likely to prove amenable to this treatment, but that lasting cures are not to be expected.

Details of 40 bovine cases showing evidence of genital disease—nymphomania, anœstrum, ovarian cysts, etc.—are given. In six cases

(*Continued at foot of column* 1, *page* 593.)

*(*Contributed by the Imperial Bureau of Agricultural Parasitology.*)

N.V.M.A. Divisional Report

CENTRAL VETERINARY SOCIETY

The presentation by Professor J. G. Wright, F.R.C.V.S., of the Royal Veterinary College, of a profusely-illustrated paper on two important aspects of canine obstetrics—the diagnosis of pregnancy and the causation of dystokia—that will, without question, rank very high amongst contributions to this important subject, was the outstanding feature of a meeting of the Central Veterinary Society held at the Conway Hall, Red Lion Square, W.C.1, on the evening of Thursday, April 12th, 1934. The addition of a valuable address on "Delivery of the Fœtus," by Captain G. Dunlop Martin, M.R.C.V.S., and an informative discussion of the whole, practically filled the remainder of a notably interesting programme.

The President (Mr. H. C. P. King) occupied the Chair, and there were also present Mr. W. Brown, Mr. H. E. Bywater (Hon. Secretary), Major T. A. B. Cocksedge, Major C. W. Davenport, Mr. J. J. Davies, Miss C. M. Ford, Captain A. Fowler, Mr. S. Gourley, Mr. Henry Gray, Lieut.-Colonel H. E. Greenfield, Dr. Tom Hare, Miss K. Hernaman-Johnson, Sir Frederick Hobday, Mr. J. W. Holmes, Miss M. G. Jordan, Mr. Herbert King, Mr. N. S. King, Major Hamilton Kirk, Lieut.-Colonel G. P. Knott, Mr. F. Land, Captain W. J. Leyshon, Miss B. L. Lock, Professor Jas. Macqueen, Major E. S. Martin, Captain G. Dunlop Martin, Professor Jas. McCunn, Mr. G. H. Mills, Dr. F. C. Minett, Major W. S. Mulvey, Miss M. Oyler, Major G. E. Oxspring, Mr. W. Perryman, Mr. C. R. A. Powell, Miss K. W. Shedlock, Captain J. Smith, Mr. J. Stewart, Mr. J. D. Williams, Professor J. G. Wright, Captain T. L. Wright and Professor George H. Wooldridge. There were present as visitors Messrs. R. Datnow, K. D. Downham, E. R. Greenwood, G. J. G. Hanford and I. Uvarov.

The minutes of the February and March meetings of the Society, having been published in *The Veterinary Record*, were taken as read and were confirmed and signed.

Correspondence.—(1) From Lieut.-Colonel E. P. Argyle, Dr. F. Bullock, Captain J. C. Coleman and Captain J. F. Macdonald, apologising for their inability to attend the meeting.

(2) *Re* resignations. The Hon. Secretary said that, as instructed at the last meeting, he had written to Major F. S. Probyn and Captain W. Watt requesting these gentlemen to reconsider their decision to resign. The latter had found himself unable to do so, but he was glad to report that Major Probyn would continue in membership. (Hear, hear.)

(3) From the Secretary of the National Veterinary Medical Association, requesting the names of the Society's representatives on the Council. Accordingly, the meeting proceeded to appoint these representatives, as follows: Captain L. S. Balls, Sir Frederick Hobday, Major Hamilton Kirk, Captain Dunlop Martin, Dr. J. McCunn, Captain W. K. Townson, Mr. R. A. Willett and Professor J. G. Wright.

Nomination.—Miss M. M. Lane, 55, Ashbourne Avenue, Golders Green, N.W.11, proposed by Mr. R. F. Wall, seconded by the Hon. Secretary.

Elections.—The following elections to Fellowship were unanimously made: Miss K. Hernaman-Johnson (Carshalton), Miss M. Oyler (Cheshunt), and Captain H. E. Wyly (Henfield).

Morbid Specimens.—Miss B. L. Lock was the only member to bring morbid specimens for exhibition. Her first exhibit comprised the intestinal glands of an 18-months-old cat. The owner (said Miss Lock) thought that the cat was having difficulty in kittening, and it certainly had a lump in its abdomen and a discharge. The lump proved to be enlarged abdominal glands, and she had noticed before the enlarged lymphatics they could see in that specimen.

Her second specimen was a premolar, which she extracted from a dog. She had never previously met with decay in the tooth of the dog analogous to the decay seen in the human tooth, but this specimen showed something very much like it.

The third and last specimen she had to show was a piece of tumefied skin taken from the elbow of a 9-months-old Alsatian. She removed it and found that it greatly resembled a botriomycotic tumour from a horse; it enclosed some cheesy material.

Exhibit.—Miss Lock exhibited a splint of a type which she found particularly useful in dealing with fracture of the humerus in the cat and in fractures in small dogs. Until she started using that type of splint, said Miss Lock, she

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having no other treatment results were very good, pregnancy resulting in three of them up to the time of writing, and in 14 further cases treated in addition by expression of an ovarian cyst and uterine treatment in a few of these, an improvement was also recorded, pregnancy following in a majority of cases.

The dose of testicular tissue used for mares was equivalent to 12-14 testicles given over a two or three week course: the dosage for cows was somewhat less.

[Whilst it is impossible to assess the value of this biological therapy in cases simultaneously treated in other ways, it appears that, so far as one can accept the case records as accurate and complete, the treatment did have a favourable effect in a few cases, whether acting specifically as a hormone or non-specifically in some way of which we may know nothing.]

J. E.

could never keep a splint on a cat. It was an ordinary open-wove bandage painted with water-glass, and it stayed on cats—a thing which she could never get plaster of Paris and wooden splints to do.

In reply to Major Kirk, Miss Lock observed that one could add water to the water-glass or not, as one pleased, but it was much better to use water-glass and hot water in the proportion of half and half.

Papers.—The President now called upon Professor Wright and Captain Dunlop Martin to present their papers on "Some Aspects of Canine Obstetrics," to which reference has been made at the commencement of this report. (These papers, and a report of the discussion upon them, are reproduced in our General Articles Section. —Ed. *V.R.*).

Votes of Thanks.—There being no other business, the President proposed a very hearty vote of thanks to the essayists, with special reference to Professor Wright "for the meticulous care with which he has prepared and presented his paper and for its immense value to the profession at large."

Dr. McCunn, in seconding, spoke of Professor Wright's paper as an outstanding illustration of the importance of recording facts and figures in the pursuit of clinical investigation.

The vote of thanks was accorded with great enthusiasm, and the meeting—one of the most successful in the long history of the society—closed with the payment of similar tributes to Miss Lock for her exhibits and to the President for his conduct of the proceedings.

H. E. Bywater, *Hon. Secretary.*

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NEW VETERINARY SOCIETY FOR SOUTH WALES

Meeting at Carmarthen

A meeting of veterinary surgeons of South Wales, in response to a circular letter, was held at the Ivy Bush Hotel, Carmarthen, on Friday, April 27th, 1934.

There were present: Messrs. J. Campbell Hill and John Evans of Llanelly, J. F. Rees, T. R. Thomas, W. D. Rees, R. Moore, D. G. Davies, D. E. Pugh, G. H. Thomas, D. H. Thomas, A. J. S. Reynolds, C. Watson, T. H. Jones, H. L. Gravelle, J. E. Thomas and W. Davies.

Mr. J. F. Rees was elected Chairman, and first called upon Mr. T. R. Thomas to read the correspondence which had been received in reply to the circular letter. These included replies from the following: Messrs. W. D. John, W. James, L. A. Watson, F. C. Hobbs, W. D. Williams, W. R. Williams, W. Morgan Williams, J. Stanley Pike, R. E. Lloyd, D. E. Davies, L. B. A. Grace, D. J. Michael, B. and E. Sayer (in favour of the proposal before the meeting) and J. L. Perry (doubtful).

The formation of a division of the N.V.M.A. in the South Wales area was discussed.

After favourable addresses had been delivered by Messrs. W. D. Rees, A. J. S. Reynolds, and J. Campbell Hill, it was resolved unanimously that a division should be formed.

It was further resolved:—

(1) That the area to be covered by the division include the counties of Brecon, Cardigan, Carmarthen, Glamorgan, Pembroke and Radnor.

(2) That consideration of the name of the division be deferred to the next meeting, the Secretary being instructed to correspond with the Mid-West and South Wales Division, pointing out that the feeling of the meeting was that this should be called "The South Wales Division."

(3) Appointment of Officers:—

President: J. Campbell Hill. (Mr. Hill then took the Chair).
Honorary Secretary: T. Roger Thomas.
Honorary Treasurer: A. J. S. Reynolds.

(4) That the Council be ten in number, five to form a quorum.

(5) That W. D. John, L. B. A. Grace, D. E. Pugh, T. H. Jones, J. E. Thomas, William Davies, C. Watson, W. D. Rees, A. Parry, and John Evans of Llanelly form the Council, with the President, Hon. Secretary and Hon. Treasurer *ex-officio* members.

(6) That the Secretary communicate with the N.V.M.A. regarding affiliation and for a set of bye-laws.

(7) That the membership fee be one guinea annually.

(8) That the division meet four times a year; that three of these meetings be held at places again to be selected and that the President choose the place of the fourth meeting; that these meetings be held on Friday and on dates mid-way between those of the Mid-West and South Wales Division; that the first meeting be held at Carmarthen in June, 1934, the date being fixed by the Council.

A hearty vote of thanks was conveyed to Mr. J. F. Rees and Mr. Hill for their conduct in the chair, and to Mr. T. R. Thomas for arranging the meeting.

Sir Ralph Anstruther, at the annual meeting in Edinburgh of the Royal Victoria Hospital Tuberculosis Trust, referring to the noteworthy improvement consequent on the inclusion of sheep's brains in the dietary, said that one of the industries which was suffering in the present depression was farming, and if they could do anything to help by urging the use in diet of sheep's brains, he thought they would be doing a good turn not only to the tuberculosis patients but also to the farming industry.

In Parliament

The following questions and answers were recorded in the House of Commons prior to the Whitsuntide Recess:—

Milk Supplies (Incidence of Disease)

Brigadier-General Clifton Brown asked the Prime Minister whether he can now announce if he will publish the report of the scientific committee appointed by the Economic Advisory Council to consider the incidence of milk-borne diseases?

The Lord President of the Council (Mr. Baldwin): This report was presented in dummy yesterday afternoon, and copies will, I hope, be available shortly after Whitsun.

Brigadier-General Brown: In view of this report being presented, will the Minister of Agriculture and the Minister of Health get into touch quickly, after considering the definition of what are accredited herds, and thus enable not only the Milk Board but local authorities to form a scheme?

Mr. Baldwin: I think the Ministers are already in touch, and I have no doubt they will bear that fact in mind.

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Slaughter-houses

Mr. Leckie asked the Minister of Agriculture whether he has yet come to any decision as to the appointment of a national slaughter-houses commission, as recommended in the recent report of the Reorganisation Commission for Fat Stock?

Mr. Elliot: I regret I am not in a position at present to add to the reply given by my right hon. Friend the Minister of Health on May 4th, to a question on this subject by my hon. Friend the Member for Gillingham (Sir R. Gower) of which I am sending the hon. Member a copy.

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Protection of Animals Acts (Convictions)

Sir R. Gower asked the Home Secretary how many persons were convicted for offences under the Protection of Animals Acts during the years 1931, 1932, and 1933, respectively; and how many of such persons were sentenced to imprisonment without the option of being fined?

Sir J. Gilmour: Statistics for 1933 are not yet available. The total number of persons convicted in England and Wales of offences against the Protection of Animals Acts and other statutory provisions on the same subject were, in 1931 and 1932, 2,152 and 2,137. The number sentenced to imprisonment without the option of a fine in each of these years was 43.

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Horses (Export)

Mr. H. Williams asked the Minister of Agriculture if he is prepared to appoint a Departmental Committee to inquire into the allegations of cruelty in connection with the exportation of horses?

Mr. Elliot: The export trade in horses was thoroughly investigated in 1925 by a Departmental Committee which found that the Acts governing the shipment of horses from this country were being efficiently enforced, and that the regulations as to the transport by sea were satisfactory. The position has not changed since then, and I see no reason for the appointment of a further committee.

Mr. Williams: Has my right hon. Friend received any specific allegations of cruelty from any of the organisations asking Parliament to pass a Bill?

Mr. Elliot: No, I cannot say that I have received any specific cases.

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Anti-Toxin Inoculation

Mr. Groves asked the Minister of Health whether, in view of the changes that are recognised and actually known to take place in the blood of certain people through inoculation of anti-toxin, he will take steps to stop the issue to the public by medical officers of health of statements to the effect that the substances used are harmless?

Sir H. Young: I am advised that the changes referred to are intended to be, and are in fact with rare exceptions, beneficial, and I see no reason therefore to take any such steps as are suggested by the hon. Member.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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DIARY OF EVENTS

May 28th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

May 31st.—R.C.V.S. Council Election, voting papers to be returned.

June 1st.—Meeting of the Southern Counties Division, N.V.M.A., at Winchester.

June 1st.—Meeting of the Midland Counties Division, N.V.M.A., at Stratford-on-Avon.

June 7th.—**R.C.V.S. Annual General Meeting.**

June 7th.—Meeting of the Central Division, N.V.M.A., at the Conway Hall, Red Lion Square, W.C.1.

June 7th-8th.—D.V.S.M. Written Examination.

June 11th.—D.V.S.M. Oral Examination begins.

June 15th.—Annual Dinner, Officers R.A.V.C., Hotel Victoria.

June 27th.—Annual Summer Meeting of the Lancashire Division, N.V.M.A., at Southport.

July 2nd.—Membership Examination Fees due.

July 4th.—R.C.V.S. Committee Meetings.

July 5th.—R.C.V.S. Committee Meetings.

July 6th.—R.C.V.S. Committee and **Council** Meetings.

July 9th.—Membership Written Examination.

July 11th.—Membership Oral Examinations begin.

July 30th-Aug. 3rd, 1934.—National Veterinary Medical Association Congress, Edinburgh.

Aug. 13th-18th, 1934.—Twelfth International Veterinary Congress, New York.

Aug. 24th.—Entries due for Jubilee Memorial Bursary Examination.

Sept. 24th-25th.—Examination for award of Jubilee Memorial Bursary.

R.C.V.S. OBITUARY

Jackson, Alexander. Old Cumnock, Ayrshire. Graduated Glasgow, December 14th, 1907; died February 19th, 1934.

Phillips, William James. Maes-y-Parc, Gnoll Park Road, Neath, Glamorganshire. Graduated London, December 21st, 1906; died February 22nd, 1934, aged 50 years.

Potts, Harry, Newbury House, Bridgwater, Somerset. Graduated Glasgow, December 16th, 1889. Died May 10th, 1934; aged 65 years.

The Bridgwater Mercury states that Mr. Potts went to Bridgwater about 25 years ago from Bristol, and established an extensive practice. He was a well-known figure in the town and the surrounding district. The death of his wife just over two years ago was a severe blow to him, and for several years he had been in indifferent health, but it was only in January last that his condition grew worse. Several days before the end he relapsed into unconsciousness. He leaves one son and four daughters, to whom the greatest sympathy will be extended. Messrs. E. C. Bovett M.R.C.V.S., and Captain Richardson, M.R.C.V.S. were among the large company present at the funeral at the Wembdon Road Cemetery.

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Death of Mrs. Henry Gray

The deepest sympathy will be felt throughout the profession with Mr. Henry Gray, M.R.C.V.S., of 85, Earl's Court Road, W.8., and other members of the bereaved family, in the death of his wife, Lavinia Gray, which took place, following an operation, in an Eastbourne Nursing Home, on Sunday last. Mrs. Gray, after a prolonged period of indifferent health—aggravated by her husband's serious illness—appeared to have benefited greatly by a recuperative stay at Eastbourne, and her death, following the performance of an emergency operation, came as a profound shock.

Lavinia Gray, who was 70 years of age, was the granddaughter of William Farrow, M.R.C.V.S., and the only daughter of William Hastings Farrow, M.R.C.V.S., who practised in Worship Street, E.C., and she will be remembered by many as one of the few women who used regularly to ride horseback through the streets of the City of London. Her family association with the profession extended yet further, however, as a brother, W. H. Farrow, and two of her uncles, John Hastings and Arthur Hastings Farrow, were veterinary surgeons, while in Mr. Henry Gray she married one of the outstanding personalities in the profession.

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LONDON CART HORSE PARADE

One of the most popular events in London on Whit Monday has for years been the Annual Cart Horse Parade, and this year's Parade was no exception, many thousands of holiday makers' finding the combination of the Parade with the charms of Regent's Park an irresistible attraction.

The entry of 667 horses and 605 drivers was slightly below that of last year, which brought out 707 horses and 634 drivers; but the general standard of the turn-outs appeared as good as ever. The judges, who included Major-General Sir John Moore, F.R.C.V.S., took into consideration the whole of each turn-out, paying due regard to the nature of its daily work. The winner of each first prize, carrying a cash premium ranging from 12s. for a single horse to 45s. for a team of four, was also awarded the brass merit badge of the R.S.P.C.A.

The prizes were distributed by Lady Milne from a platform, as the horses with their carts and passengers marched past the main entrance to the Inner Circle. Premiums for long service and good character were at the same time presented to drivers with not fewer than 25 years' continuous service with the same employer. The chief of these awards, the Isabel Constable Prize of £3 10s., went to Mr. Richard Hutchinson, for 47 years in the service of the L.M.S. Railway.

Sir Walter Gilbey, speaking at a luncheon held during the parade, said it was not the horse that was creating the traffic problems in our busy streets, but many were attempting to make the horse the scapegoat. Piccadilly, some of our bypasses, and roads round Newmarket on race day, for instance, at times resembled a race track. An increasing number of drivers of cars, not content with the very generous measure of speed that we had become more or less accustomed to to-day, had what appeared to him to be an insane idea of passing everything in front of them. Drivers of horse-vehicles had kept up the traditions and amenities of the road. They were a credit to their country and their calling, and they were still dignified enough to wear hats.

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ROYAL INSTITUTE OF PUBLIC HEALTH

Proceedings of the Section of Veterinary Medicine and Agriculture

The annual congress of the Royal Institute of Public Health opened at Norwich on May 15th. In the section on veterinary medicine and agriculture an interesting paper was read by Dr. R. G. Linton, professor of hygiene and dietetics at the Royal (Dick) Veterinary College, Edinburgh, on "The economic possibilities of scientific nutrition." It was, he said, an uncomfortable fact that notwithstanding the low actual cost of many articles of food to-day many people were unable to purchase necessities, and the producer in many cases was producing at a loss. The outstanding practical problems connected with animal husbandry were clearly how best to apply modern knowledge so as to increase the efficiency of current nutritional methods and how to reduce unnecessary costs and wastage connected with the nutrition of animals.

Any reduction that could be effected in the costs of animal feeding should benefit both producer and consumer, and it was along this line that much of the recent research work had been conducted. This had been especially the case with the feeding of dairy cows, fattening cattle, pigs, and poultry. To show the beneficial results to be obtained by the utilisation of a supplemental food Dr. Linton mentioned that chickens grew much more rapidly when supplied with separated milk instead of water.

With regard to sheep and the difficulty of knowing whether or not it would be remunerative to the farmer to supply artificial feeding, he explained the results of experiments at the Rowett Research Institute, and emphasised that increased production did not necessarily mean increased profit. The immediate difficulty was in the definition of a normal pasture. Within what limits should the composition of standard pastures lie for cattle and for sheep? He considered agricultural undertakings should be subject, so far as nutrition was concerned, to a strict audit of the economic possibilities for the purpose of increasing efficiency.

Major Q. E. Gurney (President of the section) in the course of his presidential address defended the farmer from the criticism (still current) that he was very slow to make use of new discoveries,

both in veterinary and agricultural science. Possibly this was to some extent true in years gone by, but adversity had made a marked change, and the vast majority of farmers were now eager to learn. In proof of this the Norfolk Agricultural Station at Sprowston had over 600 members paying an annual subscription, besides an unknown number of farmers who picked up any crumbs of knowledge they could without definitely identifying themselves with it. Mr. Rayns, the head of the station, told him that there were remarkable attendances from farmers and their sons at the lectures given by members of the station staff in various parts of Norfolk. He (Major Gurney) suggested that the County Council might increase their grants to enable further lectures to be given. Farmers did not make more use of their knowledge because of the great shortage of ready money, and the necessity for a very great scrutiny for resulting profits.

The farmer still kept tuberculous cattle simply because of lack of financial resources. Bovine contagious abortion was tolerated for the same reason. The farmer made use of modern science in such ways as balanced rations, artificial manures, the latest ideas on poultry and fruit, in fact in any and every way where he has not to put his hand too deeply into his pocket. Mr. Rayns hold him that many of those who could afford the luxury of producing clean milk were doing so. He knew of no less than 75 Norfolk producers who were either on the accredited register, or had entered the clean milk competition.

Major Gurney expressed the view that the present farmer's son was apt to degenerate into a mere farm labourer, simply because his father was not only unable to afford to set him up on his own, but because he had to cut down his labour bill by employing his own children, who would work longer hours for less money than the farm labourer. Agricultural scholarships were nearly always only eligible to the sons of bailiffs, smallholders, and farm labourers, though these often had more available money for education than their masters, as their savings were probably liquid, such as deposits in the Post Office, while the farmer's money was tied up in such things as ploughs. Temporary loans would not fill the gap. Finance was one of the greatest of the farmer's difficulties. Somehow it must be tackled, but how?

Thanks to Major Gurney were expressed by Mr. Nairn, of Blairgowrie (President of the National Veterinary Medical Association).

Dr. J. A. Lovern, of the Torry Research Station, Aberdeen, spoke on "Vitamins from Marine Sources," pointing out that all of the vitamins, A, B_1, B_2, C, D, and E, had been found in different marine organisms, but only two of them, A and D, in large quantities. These were mostly stored in the livers of fish, though the body oils of the pilchard, herring, and sardine contained appreciable quantities. The fat content of the livers of different fish, even of the same species, varied greatly from time to time, and no satisfactory explanation of this had been discovered. The liver oil was removed from the livers of most kinds of fish by simple steam-distillation, but this method was useless for the livers of the halibut, turbot, sturgeon, salmon, etc. From these the oil could be removed by extraction with fat solvents or by various processes developed by the firms interested in the matter. Dr. Lovern said that different samples of halibut liver oil were known to vary widely in vitamin potency, and certain firms had standardised their product by appropriate blending of samples of different potency. The vitamin D potency of halibut liver oil was not so high as its vitamin A potency in proportion to the content of these two vitamins in different cod-liver oils. The only explanation of the variations in vitamin potency in different samples of liver oils that received general agreement was that the older fish had greater stores of the vitamins than the younger.

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VETERINARY SERVICE IN STAFFORDSHIRE

At a recent meeting of the Staffordshire County Council, the Public Health Committee intimated the receipt of a report by the Chief Veterinary Officer, who commenced duty on March 5th, from which it appeared that he anticipated completing his organisation and mapping out of the various divisions in time for the six assistant Veterinary Officers yet to be appointed to take up duties in September next, the provisional divisions being Leek, Cheadle, Stafford and Wolverhampton, and areas between Lichfield and Uttoxeter, and between Stone and Kidsgrove. The Clerk had been authorised to advertise for the six assistant Veterinary Officers.

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ARMY VETERINARY SERVICE

London Gazette—War Office—Regular Army

May 18th.—Lieut.-Colonel W. N. Rowston, having attained the age for retirement, is placed on retired pay (May 18th); Major V. C. Leckie, D.S.O., to be Lieut.-Colonel (May 18th).

May 22nd.—Major H. Bone, M.C., retires on retd. pay (May 20th).

Regular Army Reserve of Officers

May 22nd.—Major H. Bone, M.C., retd. pay, to be Major (May 20th), with seniority, November 14th, 1919.

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THE LIVESTOCK INDUSTRY: A DRAFT BILL

It is understood that the Livestock Sub-Committee of the Conservative Parliamentary Agricultural Committee has prepared a draft Bill dealing with the position of the livestock industry. The Bill proposes that a Meat Commission should be set up on the lines of the Wheat Commission, and that generally the procedure of the Wheat Commission should be adopted. For the purpose of the scheme a standard price of 48s. a hundredweight is fixed for beef and 56s. a hundredweight for mutton, and it is suggested that there should be a levy of a penny a pound on all meat imported into this country, whether from the Dominions or foreign countries. Livestock brought into Great Britain for slaughter would have to be killed at the port of entry, and in this case there would be a levy of three farthings a pound. It is estimated that about £6,000,000 would be raised annually from the levy on dead meat and £1,000,000 from the levy on livestock, and this money would be used to meet the deficiency payments which the Meat Commission would be called upon to make.

The Conservative Parliamentary Agricultural Committee, at its meeting on May 1st, unanimously adopted the report of the Livestock Sub-Committee. The proposals have been forwarded to the Government.

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ESTATE FOR GAME RESEARCH

An experimental game research estate has been established at Knebworth Park, Hertfordshire, by Imperial Chemical Industries, Limited. The work on the estate is being co-ordinated with

field and experimental activities on six "key" estates in various parts of the country, while contact will be maintained with more than 100 other estates for statistical and other purposes. The main research relates to the study of the mating and rearing in captivity of English, French and Hungarian partridges, and the aim is to supply those whose partridge stock is becoming short with the most modern advice on how to mate, breed and rear effectively partridges either from their own stock or from stock supplied from game farms.

The study of the control of the partridge population has been chosen because it is considered to be the key to English game preservation. The estate at Knebworth will have a stock sufficiently small to ensure close and accurate observation and it is intended to put at the disposal of keepers and others the results of a five-year plan of research into game preservation. The service includes the scientific observation of pheasants, ground game, vermin, and other animals, and an examination of internal and external parasites. A study will be made of insects and weeds, foods and feeding systems, and grits and manures. An advisory service has been arranged for the benefit of holders of shooting rights who are unable to employ keepers and to assist the "small" shooter to produce better crops of game. This service includes correspondence, publications, and personal visits.

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MARKING OF IMPORTED MEAT

A draft of an Order in Council under the Merchandise Marks Act, 1926, to require imported chilled, frozen, boneless, and salted beef, frozen mutton and lamb, frozen and salted pork, frozen and boneless veal, and edible offals to be marked with an indication of origin has been laid before Parliament as required by Section 7 of the Act. The text of the Draft Order in Council appears in the *Board of Trade Journal* of May 10th, and copies of the Draft Order may be obtained through any bookseller or directly from His Majesty's Stationery Office, Adastral House, Kingsway, London, W.C.2.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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TUBERCULIN TESTING OF GRADED HERDS

To the Editor of The Veterinary Record

Sir,—We are all indebted to Mr. Edwards of Mold for drawing attention to an interesting question, involving professional ethics and policy, *viz.*, "Should the practitioner be debarred from carrying out tuberculin testing of a client's dairy herd for the purpose of a Grade A or Certified certificate?"

We all know that Government imposes the duty on a Local Authority of carrying out the provisions of the Milk and Dairies Act. But it seems to me that a Local Authority must always act with due regard to existing professional regulations and ordinary standards of justice.

We have practitioners earning part of their livelihood by tuberculin testing. The general practitioner is recognised as one whose occupation is the controlling and curing of animal disease. He feels that the Charter of the Royal College is sound. He accepts the restrictions of its bye-laws, believing that there is neither fear nor favour in them.

Yet let him consider what is happening.

Having tested clients' herds for years, considering it part of his day's work, the practitioner is suddenly told by the Local Authority that he is not eligible to do further testing, which will in future be carried out by its own inspector.

Our professional policy of "Fair play, without fear or favour" still stands. I believe that 90 per cent. of us are convinced of an injustice, and that both the letter and spirit of our charter are broken. And this is not all. I believe that if the situation is properly explained to any County or other Councillor, the latter is also convinced of injustice. He does not assent to restrictions, well knowing that, paramount to every other consideration, comes justice to every member of his local community—neither more nor less.

I note in your issue of May 5th, that Bolton Borough Council have laid down the principle that "their Veterinary Officer shall not carry out the prescribed tuberculin testing of herds of cows, in respect of Certified Milk or Grade A Tuberculin Tested Milk."

Other Local Authorities are willing to consider this question of tuberculin testing on its merits. I hope to see the "National" make a brave stand for the general practitioner, and the principle of free and fair competition.

The traditional policy and ethics of the Royal College will support them, as well as the great body of the profession.

Thanking you for the courtesy of your columns,

I am,

Yours faithfully,

A. J. Kennedy.

Thornhill,
Dumfrieshire.
May 22nd, 1934.

The Editor acknowledges, with thanks, the receipt of the following:—

Communications from Messrs. R. A. S. Macdonald and H. S. Purchase (Northern Rhodesia), J. H. Norris (Dublin), and Arnold Spicer (Oxted).

Reports of meetings of the Dumfries and Galloway, the Lancashire and the Western Counties Divisions, N.V.M.A., from Messrs. George A. Sangster, A. L. Mullen and S. J. Motton, respective Hon. Secretaries.

R.C.V.S. Council Election

To the Fellows and Members of the Profession.

At the request of many members of the profession, I have consented to my nomination as a candidate for the forthcoming Election of Council, R.C.V.S., and I venture to solicit your support.

I am of opinion that, numerically, general practiticners and particularly country practitioners are insufficiently represented on the Council, and their interests are liable to suffer in consequence. As a general practitioner, I feel at this very serious time in the affairs of the profession, when our very existence is being threatened, that we need to voice more adequately our case for equitable consideration in the solution of those problems which so vitally affect our interests, especially as regards public health work.

I am of opinion, also, that such matters as free tuberculin testing and the provision of free Veterinary Services for the Sick Animals of the Poor and the present form of the Veterinary Advisory Scheme need careful and broad consideration from the point of view of their ethical bearing upon our professional interests as a whole and their economic effects upon the future of general practice in particular.

I may add I am the third generation in veterinary practice and, if elected, will endeavour to serve the profession to the best of my ability.

Signed,

London, S.W.2. Leonard S. Balis.